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THE

FARMER'S CALENDAR:

CONTAINING THE

BUSINESS NECESSARY TO BE PERFORMED

ON

VARIOUS KINDS OF FARMS

DURING

EVERY MONTH OF THE YEAR.

BY ARTHUR YOUNG, ESQ. F. R. S.

SECRETARY TO THE BOARD OF AGRICULTURE,

Honorary Member of the Societies of Dublin, Bath, York, Salford, Odiham, South Hants, Kent, Essex, and Norfolk; the Philosophical and Literary Society of Manchester; the Veterinary College of London; the Economical Society of Berne; the Physical Society of Zurich; the American Society of Massachusetts; the Palatine Academy of Agriculture at Manheim; the Imperial Economical Society established at Petersburgh; the Royal and Electoral Economical Society of Celle; Member of the Society of Agriculture for the Department of the Seine, France; and Corresponding Member of the Royal Academy of Agriculture at Florence; of the Patriotic Society at Milan, and of the Economical Society at Copenhagen.

THE EIGHTH EDITION,

GREATLY ENLARGED AND IMPROVED.

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GARDENERS have found great use in Calendars of their necessary work for every month in the year; and, if the two employments of the Farmer and the Gardener be well considered, it will appear that the former wants such a remembrancer, at least as much as his brethren in the garden.

At the beginning of every month, a good Farmer, whether he has or has not a book of this sort, is obliged to reflect on the work he has to perform in that month: he ought to foresee the whole at once, or it is impossible he should make a proper provision for its due performance. I leave it to any one to judge, if such an estimate of monthly business can be gained so easily, completely, or systematically, without such an assistance to the memory as is afforded by this Work; and even if a book of this sort but once in a year gives intimation of some important work, which might otherwise have been forgotten, its worth must be acknowledged.

F363130

In respect to the Calendars which had appeared previously to this Publication, they were very slight and imperfect sketches, generally nothing but additions to other books; and their authors omitted at least as many useful articles as they inserted.

TO THE NEW EDITION.

In various parts of the Correspondence published during the last eighteen years in the Annals of Agriculture, *I have been called upon for a New Edition of this Calendar, and have as often resolved to give it; but the new improvements which have taken place, made so many and such great alterations necessary, that other and more pressing employments have prevented the undertaking. It is at last completed; and I hope the Reader will find it, in the present form, worthy of his attention.*

A. Y.

Bradfield Hall,
October 20, 1808.

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TO THE BINDER.

Place the Plate of Irrigation opposite page 313;
And that of Watered-Meadows, opposite page 316.

THE

FARMER'S CALENDAR.

JANUARY.

SHEEP.

IN this month ewes of some breeds of sheep will lamb. Great care ought to be taken of them: till then they seldom want turnips; most ſarmers having grass either in whole fields, kept walks, or in borders, &c. sufficient for lean stock till they are near lambing, when they should have turnips regularly given them. If the land be not dry, the best method is to draw the turnips, and cart them to a dry pasture, and there bait the sheep on them twice a day, observing well, that they eat clean, and make no waste; which is not a bad rule for ascertaining the quantity necessary. In this way, the turnip crop goes the farthest. On dry soils, the best way, for the sake of manuring for barley, is to eat the crop on the land, hurdling off a certain quantity for the flock; and, as fast as they eat pretty clean, to remove the hurdles farther. This method saves much trouble, and is highly improving to the land; but it should be practised only on lands that are dry, otherwise the sheep poach, and do mischief. The crop will not go quite so far as if drawn and laid in a grass field; for the sheep dung, and stale, and trample on many of the roots after they are begun, which occasions some little waste: nor is there any loss of manure in carting them, only it is left, in one instance, on the arable field, and, in the other, on the grass one. No improvement can be greater than this of feeding the sheep with turnips. On whatever land they are given, the benefit is always very great.

It is further to be observed, that many sheep are fattened on turnips, particularly wethers; in which system of husbandry many of the turnips are wasted, if you have not two flocks, one lean, to follow the fatting sheep, and to eat up their leavings; for sheep will not eat clean in fattening.

In very wet weather, storms, or deep snows, the sheep and lambs should be baited on hay. Some farmers drive them to hay-stacks, which shelter and feed them, but it is wasteful. Others give the hay in moveable racks; and allow a certain quantity every day. It is an excellent method, to allow them in their racks a small quantity of hay daily while on turnips, let the weather be good or bad: but this is not absolutely necessary.

In some parts of the kingdom, the best farmers give their ewes and lambs in this month bran and oats, or oil-cake, in troughs, while they are feeding on turnips; but it must be a good breed, for such a practice to repay.

FOLDING SHEEP.

In respect of folding, a very great change has taken place on inclosed farms in the practice of the best farmers, especially in Norfolk. They are now fully convinced, that it is an unprofitable practice, except where the openness of downs and common fields renders it necessary for the purpose of confinement. The number of sheep that may be kept on a farm without folding, is much greater than can be supported with it. This is a very essential point. There is a deduction from the farmer's profit, in the injury done by folding to both ewe and lamb, which has been estimated by experienced judges, at from 2s. 6d. to 4s. per ewe; so that a farmer should consider well, before he determines to follow a practice, which, from a multitude of observations, is pronounced unprofitable. Mr. Bakewell used to call it robbing Peter to pay Paul. The arguments now used in its defence are not satisfactory: it is contended, that if sheep be not folded, they will draw under hedges, &c. for shelter in bad weather; if so, they ought to be allowed to do it, for more would be lost in such cases by forcing the sheep from shelter, than the value of their fold. Where this practice takes place, good shepherds will, in case of rain, get up in the night, and let their flocks out of fold, knowing the consequence of confinement on arable land in wet weather. The instinct of these animals will conduct them much better than our reason, not only where to fly for shelter, but also for choosing their own time to go to rest, and to feed in the morning. These they vary according to seasons and weather; but folding prevents it, and forces them to a regularity never called for by the weather.

When I began first to entertain doubts of the propriety of folding sheep on any farms in which they can be kept to certain fields in the night without that practice, I desired earnestly to try some experiments that might throw more light on the question than it was possible for reason to do; but to effect this comparatively, was very difficult, as the trial I wished for was such, as should carry some positive conviction with it. I have not been able to effect it fully; but the trials I have made, may not be found destitute of power to throw some light on this interesting question. I am perfectly persuaded, that it would have been impossible for me to have kept on the same land, nearly such a stock as I have done, if in one parcel with folding. I do not conceive that the fields would have carried three-fourths, so managed. Four drivings in a day make them trample much food, disquiet the sheep, and transfer the choice of their hours of feeding and rest from themselves to the shepherd and his boy. While lambs are young they are injured by this, and the ewes are liable to be hurried and heated; all which are objects that should weigh in the question. When sheep are kept in numerous parcels, it is not only driving to and from fold that affects them, but they are, in fact, driving about in a sort of march all day long, when the strongest have too great an advantage, and the flock divides into the head and the tail of it, by which means one part of them must trample the food to be eaten by another. All these points are the reverse of their remaining perfectly quiet in small parcels.

But the question turns on the benefit to be reaped by the fold; for if that be great enough to compensate for the loss by such circumstances, the practice may not be condemned.

I believe the reason why farmers are such warm advocates for folding, arises from the power it gives them of sacrificing the grass lands of a farm to the arable part of it. Their object is corn, by which they can carry off a farm, whatever improvement they bring to it. Grass improved is profit to the landlord in future; and tenants are too apt to think that this is his at their expence. They do not at all regard impoverishing a grass field in order to improve a ploughed one; and I need not observe, that every sort of sheep-walk is thus impoverished; so that ancient walks, which have been sheep-pastured perhaps for five centuries, are no better at present than they ever were before; whereas most fields sheep-fed, without folding from them, are in a constant state of amelioration: this leads me to remark the effect I observed on several of my own fields.

I attended, through the course of a summer, many gentlemen over my fields, with a view to examine whether the sheep had seemed to have rested only on spots, to the too great manuring of such; or, on the contrary, to have distributed themselves more equally; and it was a pleasure to find, that they seemed generally to have spread in every part, if not quite equally, at least nearly so. The improved countenance of several old lays fed in the same manner, when examined in autumn, convinced me as well as my bailiff, that the ground had been unquestionably improved considerably: Those fields had carried a very bad appearance for some years, but they were, after sheep-feeding, of a rich verdure, and as full of worm-casts as if they had been dunged. I rolled them heavily in November, but they soon became rough again by worms, and demanded much rolling in spring. They had afterwards a greener and more fertile appearance by far than ever they wore before.

The whole of this circumstance, the value of which I shall be able to appreciate in the trials of future years, belongs to this method of dividing flocks, to the exclusion of folding. The fold is valuable, but so is the improvement of the grass land, and may, for what I know, nearly equal it: when, in addition, we include the greater number of sheep that can be kept, and the favour done to them by letting them alone, there remains, in my mind, no further doubt of the fact.

It is common to hear flock-farmers in open countries say, they have not the power to manage so.

This may be very true, upon the major part of the farms, but such have often many inclosures, in which this management might be applied without difficulty.

But if we suppose folding to be the system pursued, I may remark, that the farmers in those parts of the kingdom which understand it best, do not extend it so far as they might; they give over folding in November or December, whereas it may certainly be carried on through the whole winter with profit; ever supposing that the practice is *necessary:* on those farms which have a perfectly dry gravelly pasture or two, it is advisable to fold all winter on such dry grass land. It must not be attempted on moist arable land, nor on moist grass land; but on dry pastures. The safety to the sheep is greater, and the benefit to the grass an object. There is another method of gaining all the benefit of folding, quite through the winter, and on all soils; this is, to confine them at night in a sheep-yard, well and regularly littered with straw, stubble, or fern; by which means you keep your flock warm and healthy in bad seasons; and at the same time raise a surprizing quantity of dung; so great a quantity, if you have plenty of litter, that the profit will be better than folding on the land. An improvement would be, giving the sheep all their food (except their pasture) in such yard; viz. hay and turnips; for which purpose they may be brought up not only at night, but also at noon, to be baited; but if their pasture be at a distance, they should then, instead of baiting at noon, come to the yard earlier in the evening, and go out later in the morning. This is a practice which cannot be too much recommended; for so warm a lodging is a great matter to young lambs, and will tend much to forward their growth; the sheep will also be kept in good health; and, what is a point of consequence to all farms, the quantity of dung raised will be very great. If this method is pursued through the months of December, January, February, March, and April, with plenty of litter, 100 sheep will make a dunghill of at least 60 loads of excellent stuff, which will amply manure two acres of land; whereas 100 sheep folded (supposing the grass dry enough) will not in that time equally manure one acre.

It should be kept in mind, that this admirable practice does not demand that the sheep should be kept in large flocks, for the expence of forming these yards is so small, that there may be many of them on a farm, in order to prevent the disadvantages of driving to a distance, and that of keeping too many together in the same flock. I had six of these yards for many years on my own farm, and found the advantage of them very great.

SHEEP IN ROUEN.

Such ewes as have lambed before, and in this month, should be drawn off from the flock, and put into rouen in inclosed farms, to give early lamb; but this remark is not applicable to flock-farms, where the grand support is the turnip crop. On such, the rouen should be preserved till the period of distress arrives, when turnips are done, and forward grasses not ready.

FARM-YARD.

In this month a strict attention should be given to the cattle in the yard or yards; those I mean which run loose there. Care should be taken to have them regularly supplied with straw, if that be the food, and that they have always water at command. The thrashers should be so proportioned to the stock of lean cattle, as to make the straw last just through the winter. Take good care also to keep the yard well littered from the stacks of straw, stubble, fern, &c. raised in autumn, so that the cattle may always lie perfectly dry and clean. Their health requires this attention; which should, at any rate, be given, were it merely for raising large quantities of manure.

STRAW.

While it is noted, that if the cattle are fed with straw, it should be done with certain necessary attentions, it would be an omission not to remark, that the best farmers in Norfolk are generally agreed that cattle should eat no straw, unless it be cut into chaff mixed with hay; but, on the contrary, that they should be fed with something better, and have the straw thrown under them, to be trodden into dung; and I am much inclined to believe,

lieve, that in most, if not in all cases, this maxim will prove a just one. The common cases of straw-feeding are, of cows, young cattle, or black cattle just bought in, and not yet put to fatting. With regard to cows, the food is certainly insufficient, and lets them down so much in flesh, that when they calve, and are expected to yield productively, they lose a considerable time, and that, perhaps, the most valuable, in getting again into flesh, before they give their usual quantity of milk; but if they have been well and sufficiently wintered, they are half summered, and yield at once adequately. For young cattle, it is still worse management; for their growth is stunted, and they never recover it. Black cattle from poor mountains had better be put to straw than any other stock; but here again care must be taken that the system be not deranged by it. If well fed, and the beasts be not large, they may be cleared off between harvest and the end of November; but if they are wintered on straw, this may not be effected, and the farmer may be forced to put himself to the expence of corn or oil-cake, to feed beasts not of a size to pay well enough for those articles. The observation is made upon the supposition, that common notions and too vague assertions are just; but it is a point by no means ascertained with sufficient accuracy, that small beasts will not pay for expensive food as well as large ones. The evil is less if he has plenty of turnip or cabbage; but for these he may have other applications. In so far as regards the quality of the farm-yard dung, all this reasoning becomes still more forcible; for from straw-fed cattle, the farmer will, at the end of winter, find perhaps a large heap, of so poor a quality, that it will go but a little way in manuring his fields; whereas, one load of dung made by fat or well fed cattle, will be equal to two or three of it.

The proper food for cows in this month is cut chaff, one half hay and the other half straw, with a good bait of turnip or cabbages. For young cattle, the same chaff, and as much cabbage as they will eat; and the same, or turnips, for black cattle.

BEAN-STRAW.

"Bean-straw, if well harvested, forms a very hearty and nutritious diet for cattle in the winter time, and both oxen and horses, when not worked, will thrive on it: sheep, also, are very fond of browzing on the pods, and the caving is a very nutritious manger meat."—*Bannister.*

The importance of putting beans in early, and reaping soon enough, will appear clearly, when I observe that the straw, well harvested, is worth from two to three pounds per acre. Mr. Arbuthnot's teams, which were always hard worked, never had a truss of hay while his bean-straw lasted.

CUT-CHAFF.

The number of engines which have of late years been invented for cutting hay and straw into chaff (most of which execute their work sufficiently well), leaves no farmer in the kingdom under the necessity of using the common chaff-box, worked by those only who have acquired the art of using it, and who usually make much greater earnings than the common pay per diem. Of these machines, I believe Salmon's has the preference; the price is 12l. 12s.; but a very good one is made at Thetford for eight guineas; and another by Passmore of Doncaster, which is also effective, for 7l. 7s. The practice of cutting both hay and straw for all sorts of stock, is one that has been found very important by many practical and intelligent cultivators of great experience. General observations are not so satisfactory as comparative experiments; but there are not many persons who have opportunity, time, and power, to compare the food and labour of two different teams, the one fed in the common way, with hay, and the other with cut-chaff, half or one-third straw. The opinion of the best informed persons is decidedly in favour of the latter. However, if racks are permitted in a stable, it is not an easy matter to prevent horse-keepers from cramming them full of hay, and especially at night. The best contrivance I have heard of to supply the place of racks, was that of Mr. Vancouver, who made a sort of hopper the whole length of the manger, which delivered chaff from a loft above it, gradually, as the horses moved the lower lip of the hopper with their noses, in this manner supplying themselves. But a very intelligent nobleman trying it, found that it would not deliver regularly: this might arise from the dimensions not having been sufficiently attended to; for if the hopper be not of a due breadth, the chaff might arch above the moveable board, and not come down; the aperture in the manger through which it passes, must necessarily be of a certain size, neither too wide nor too narrow. It certainly seems to be a practicable idea, and very capable, after some trials and regulations, of being fully applicable to common practice. It well deserves attention, especially as the expence of an experiment for one stall could not be considerable. I have often determined to try it myself, but have always been prevented, by some journey or excursion taking me from home at the moment when I could otherwise have given the requisite attention. I conceive that it would demand a manger from four to six inches wider than common ones.

The practice, however, of giving hay cut with a mixture of straw, instead of feeding in the common way with hay, is to be recommended, at all events, to as great a degree as can be effected; for the saving is unquestionable. Nor is it to be practised for the teams only, but also for all other stock that eat hay. Mr. Page, of Cobham, in feeding his stock, gives no hay or straw but what is cut into chaff. At the expence of only 5l. he added a mill-wheel to his chaff-cutter, by which means a boy and a little poney cut 20 bushels per hour.

This practice he finds so profitable, that he earnestly recommends it *.

For sheep, attention must be paid to the troughs in which it is given, to see that they be so boarded as to prevent the wind from blowing the chaff out: this is effected in Lord Clarendon's sheep-yard, in Hertfordshire, by a semicircular boarding, which covers the sheep's heads while feeding in the troughs.

COWS.

Several cows will probably calve in this month; about a month before which, they should be taken into the cow-house from the straw-yard, and be baited twice a day with green food; turnips, cabbages, carrots, potatoes, or whatever is the field winter food. After they calve they should be kept quite separate from the lean stock, either in the house or in another yard, and be fed upon those articles and hay, or *very good* straw. Cabbages will maintain cows in the cheapest manner, and make the butter perfectly sweet; but the decayed and yellow leaves must be picked off, giving the cows nothing but the heart of the cabbage: the refuse leaves will be ate clean up by the lean cattle. The great expence of winter feeding cows with hay alone, eats up half the profit of the dairy, even if none be given till they calve; for supposing them to calve in January or February, there remains three or four months for that food.

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* Annals of Agriculture, vol. xxviii. p. 107.

If the dairy consists of more than one or two cows kept for the use of the farmer's family, the system of feeding them becomes an object of considerable importance, and should be well digested. This subject demands most attention at Michaelmas, when all arrangements of stock take place. In the Calendar for October, it will be particularly considered; but as in January the cows are probably calving, their food demands a careful attention. The preceding remarks suppose them taken from the straw-yard; but let it be remembered, that superior managers, about Epping, as well as in North Wiltshire, &c. are cautious of letting their cows at any time depend on straw.

If no other food be provided, they have hay only; it is not necessary to consider whether it will answer to give it to them when at certain high prices, as many farmers are, by their leases, deprived of the power of selling hay: where this is the case, the hay must be valued at what it costs, and not at what it would sell for: this estimate is easily made.

	£.	s.	d.
Rent of an acre,	£.1	0	0
Tithe,	0	3	0
Rates,	0	5	0
Mowing, making, carting, and stacking,	0	10	0
Manuring once in four years,	0	15	0
Fences,	0	1	0
	£.2	14	0
Interest and profits, ten per cent.	0	5	4
	2	19	4
After-grass, if sold,	0	10	0
Expence of hay,	£.2	9	4

Such land, therefore, if it produces one ton of hay, ascertains the cost of the hay to be 49s. 4d. a ton—say 50s. Supposing then a cow to be fed at the rate of 56lb. per diem, and that only during 120 days, it is exactly three tons, which at 50s. is 7l. 10s. No other calculation is necessary, to prove that feeding cows with hay is ruinous. I have fed cows with my own hands, that have ate 56lb. per diem; but supposing only 30lb. per diem, it is above one ton and a half, at 50s. above 3l. 15s. which, for four months only, is much too high; and ought to convince the young farmer how necessary it is for him to provide green winter food.

In the *Annals*, vol. xvi. p. 361, is an experiment of mine, in feeding smaller cows, such as would fatten to about 45 stone (14lb.) Three milch ones ate, in October, 96lb. each, of cabbages, per diem: and, in another trial, 89lb. of cabbages, and 10¾lb. of hay each per diem; or, in the proportion of 2 tons, 18 cwt. of cabbages, and 15 cwt. of hay, in six months.

In the weaning of calves there are many different methods.—In Suffolk they do not wean till after Christmas, letting them suck six or seven weeks; then they give bran and oats, with flet milk and water, and some very sweet hay by them, continuing this till grass is ready: but, if the farmer has carrots, they make an excellent article of their food, and save oats. The Duke of Northumberland's method succeeded with his Grace repeatedly, and I tried it with equal success. His account is this: "I have for some time entertained an idea that skimmed milk might be prepared with proper ingredients, effectually to answer the purpose, where the practice is to give new milk from the cow, and at about a third of the expence. The articles are treacle, and the common lint-seed oil-cake, ground very fine, almost to an impalpable powder, and the quantities so small, that to make thirty-two gallons would cost no more, exclusive of the milk, than about sixpence. It mixes very readily, and almost intimately, with the milk, making it more rich and mucilaginous, without giving it any disagreeable taste.—Take one gallon of skimmed milk, and in about a pint of it add half an ounce of common treacle, stirring it till it is well mixed; then take one ounce of lint-seed oil-cake finely pulverized, and with the hand let it fall gradually in very small quantities into the milk, stirring it in the mean time with a spoon or ladle, until it be thoroughly incorporated; then let the mixture be put into the other part of the milk, and the whole made nearly as warm as new milk from the cow. After a time, the quantity of oil-cake may be increased."

THE DAIRY.

Mrs. Chevallier, a lady very attentive to a very successful dairy, remarks, that in winter, it is a good way to add hot water to milk, directly as it comes from the cow; it makes it yield the cream better. The trays in which it is set, should also be scalded with hot water, or else warmed by the fire, before the milk is set in them. All trays should be of deal, about three inches and a half deep: they are preferable to leaden ones, which not only blister when hot water is poured into them, but are also said to be unwholesome. About twelve square yards of tray, with some spare bowls, will do for twenty cows. The churn for such a dairy should contain about fifty gallons beer measure. The copper should hold 100 gallons. Chaffing-dishes of charcoal are kept in dairies in frost, but then the cream does not rise so well. The best dairy-maids never put the butter in layers in the firkin; but leave the surface every day rough and broken, in order to unite better with that of the succeeding churning. In Suffolk, from three and a half to four pints of salt are commonly used to a firkin of butter; but two, with good management, are better. The milk, after the first skimming, is left twelve hours (more in farm-houses), to make a second butter, which is sold to the poor at an inferior price. A dairy-maid commonly milks seven or eight cows in an hour.

YEARLING CALVES.

"These are very subject to the garget, *supposed* to resemble the rheumatism in the human body: lying wet, either in yards or in fields, will give it. To be kept perfectly dry, is an almost sure preventative."—*Mrs. Chevallier.*

YOUNG CATTLE.

The last year's calves should now be fed with hay and roots, either turnips, carrots, or potatoes; and they should be thoroughly well fed, and kept perfectly clean by means of litter: at this age it is a matter of great consequence to keep such young cattle as well as possible, for the contrary practice will inevitably stop their growth, which cannot be recovered by the best summer food. If hay is not to be had, good straw must be substituted; but then the roots should be given in greater plenty, and with more attention. To steers and heifers two years old, the proper food is hay, if cheap; or straw, with baits of turnips, cabbages, &c. It is not right to keep yearling calves and two-year olds together; because, in general, the younger the cattle are, the better they should be fed.

FATTENING BEASTS.

At this time, the farmer who makes it his business to winter fatten, is in the height of his work. There are three methods of fattening cattle, viz. carrying their turnips, &c. to a dry grass-field, to a farm-yard, or to the house where the beasts are tied up: the two latter methods are the best. Not many pastures are dry and sound enough to bear the tread of an ox in winter; but great numbers are fattened in the field, in Norfolk, eating the turnips where they grow. If fattened in a yard, the food, viz. turnips, cabbages, or carrots, must be given in mangers under open sheds, with good cut chaff always in them, if hay is not plentiful; but they will pay well for the best hay. The same rule is to be followed in stall-feeding: they must be littered well, or else they will presently have a bound hide, and not thrive. In either of these methods, plenty of litter must be provided. I would advise the use of three waggon-loads of straw, stubble, or fern, to every beast, for so much they will make into dung, which ought to be the guide, and not the expence of the litter, as the dung will repay that with great profit. I am sensible that less will do; but it should always be remembered, that raising dung is the grand pillar of husbandry.

OIL-CAKE AND CORN-FED BEASTS.

Feeding beasts in this manner is so very expensive, that if the greatest attention be not paid to them, the loss will be considerable. The points to be constantly attended to, are: 1st, cleanness of lodging, by constantly removing dung, sweeping the pavement clean, and giving plenty of litter, to prevent all filth from sticking to their hides; 2d, clean mangers, often washed; 3d, and the most material article, to give very little food at a time, and to vary it properly. Beasts which are carelessly fed in this respect never thrive well. The master's eye is constantly necessary. 4th, To keep them warm enough by shelter, for warmth fattens almost as much as food. These attentions are necessary for all cattle stalled, whatever their food may be, but if neglected with that sort, which is very expensive, the mischief is more felt.

SWINE.

This is a principal season with swine, both for fattening and rearing. As the two first are mentioned largely under other months, I shall at present speak only of the management of sows and pigs. Each litter must be kept in a sty, and fed with dairy-wash out of cisterns, and with the food stored for them in autumn, such as carrots, parsnips, potatoes, and cabbages; all these do for them excellently. To substitute barley or pease, or even purchased bran or pollard, is therefore unprofitable. The sows should always have as much as they will eat, or the pigs will suffer; and what is of as much consequence, is keeping them well littered. Let them be always perfectly clean; it ensures the health of the pigs, and at the same time raises a large quantity of the best manure on a farm.

The breeding of swine being one of the most profitable articles in the whole business of a farm, the husbandman cannot pay too much attention to it. I shall, in as few words as the subject will admit, give an account of the best system to be pursued in this branch of his business. The farmer who would make a considerable profit by hogs, must determine to keep a proper number of sows, in order to breed many pigs; but this resolution ought to be preceded by the most careful determination to prepare crops proper for supporting this stock. The proper ones for that purpose are barley, buck, beans, pease, clover, and potatoes, or carrots. In the common management, a farmer keeps only a sow or two, because his dairy will do no more; but in the system of planting crops purposely for swine, a different conduct must necessarily be pursued. Potatoes, carrots, Swedish turnip, and cabbages, must be provided for the sows and stores from October till the end of May, by which time tares, clover, chicory, or lucerne, should be ready to receive them, which will carry them till the stubbles are cleared; so that the whole year is filled up with these plants, the common offal of the barn-door and the corn-fields. When the sows pig, meal must be provided to make wash, by mixing it with water. This in summer will be good enough for their support, and in winter it must be mixed with boiled roots, oats, and pea-soup, for the young pigs. If cows are kept, then the dairy-wash is to be used in the above mixtures.

Upon this system, a farmer may proportion his swine to his crops, or his crops to his swine; and he will find that for the whole year he should have about an equal quantity of roots and grass, and half as much corn as potatoes. For carrying the profit to the highest advantage, the sows should pig but twice a year; that is, in April and August; by which means there will never be a long and expensive season for rearing the pigs before they are put to the staple food of clover or potatoes, &c.; but this circumstance is much removed by the provision of crops raised expressly for swine.

Upon this plan, the annual sale of lean hogs should be in October, the litters of April sold then as stores, and those of August kept till October twelvemonth, to sell for baconers, if the farmer fats none himself. The stock upon hand this month will therefore be the sows, and the pigs littered in the preceding August; all which should have roots from the store, and run at the same time in the farm-yard, for shacking the straw of the barn-doors. In proportion to what they find in this, you must supply them with roots, giving enough to keep them to their growth.

WEANED PIGS.

It has been often remarked, that winter pigs are unprofitable; and it is certainly true, if they are not kept with great care and attention. Where there is a dairy, the milk and whey may be so profitably applied to their use, that it should be preserved carefully for that purpose. The best addition, or which alone will wean them well, is pea-soup. Six pecks of pease boiled in a hogshead of water till well broken and dissolved, and then mixed in a tub or cistern with dairy-wash, or given alone, will wean them well. If dry meat be given in addition, or alone, it should be oats, which do for young swine far better than other sorts of grain. Barley does not agree nearly so well with them.

HORSES.

One of the most useful general lessons that can be given to an arable farmer, is to keep his horses always at work. The expence of a team is so great, that, if he does not pursue this rule, he must lose by them. January is a month in which all business of tillage ought to be at a stop. If the weather be a hard frost, care should be taken to make use of it in carting manures on the farm. If there are composts ready, a frost should not be let slip; or, if there be faggot-carting to be performed, or the earth of borders under hedges to be carried, the carts should be kept close to work of that kind, as long as the frost lasts. But in open weather, road-work must be done. Carting out the corn may not nearly employ the teams; on other days the carts should go to the nearest town for manure. There certainly are situations precluded from this advantage, but not many. How well it would answer to keep a team on purpose for the employment, depends on various circumstances; we may however be assured, that it must answer to employ the teams about it, when they would otherwise stand still; for then the expence is little more than labour and wear and tear.

The same observations are partly applicable to the ox-teams; and the farmer should have a strict eye, that both horses and oxen have plenty of litter, otherwise his farm will suffer from a deficiency of manure.

THRASHING.

I before remarked, that the farmer, in thrashing his crops of corn and pulse, should be attentive to proportion his thrashers to his stock of lean cattle, that neither more nor less straw may arise than is regularly consumed. Relative to the management of the thrashers, the farmer should be very clear-sighted to their motions, both as to the cleanness of their work, and as to their honesty. He may lose immensely if his straw be not thrashed clean; and as it is a work generally performed by measure, the men are too apt to turn it over too quickly, and to thrash out only that corn which comes the easiest from the ear. In respect to pilfering, the work gives them greater opportunities for it than any other; for which reason, he should have a sharp look out, and take care now and then to meet the men of an evening in their way home, and to come upon them in the barn, at various times, and unawares. Such a conduct will keep the men honest, if they are so already, and will prevent many knaves from practising their roguery; whereas an indolent, inattentive master, will make pilferers.

THRASHING-MILL.

If the farmer has one of these most useful implements, he is safe from the two evils mentioned in the preceding article. The expence of a fixed mill, is from 60 to 100 guineas for one that requires two or three horses. It will thrash about 15 quarters of wheat in eight or nine hours, and from 15 to 20 quarters of barley, oats, pease, or beans. Barley is the grain that thrashes worse with them than any other; but I have seen several that thrash it as well as other corn, such as Mr. Asbey's, at Blyborough, Suffolk. His price, for a fixed one, 75 guineas, and for a moveable one, 120 guineas. The granary should always be over the fixed mill, that the corn may be drawn up at once, and lodged safe under the farmer's key. For *feeding* cattle, fresh-thrashed straw is better than old; for littering (the proper application) they are equal; but the best management for eating straw clearly is, to cut it into chaff by the power of the mill, and to have the chaff-house adjoining, so as to receive the cut straw at once, without any carriage. This house should have brick walls, in order that fermentation may not set fire to any thing, and then if water be thrown on the chaff, it ferments, and is much more nutritious* than when used in the common way.

FENCES.

This is a principal season for hedging and ditching. A farmer cannot give too much attention to the fences of his farm; for, without good ones, he might as well cultivate open fields: he cannot manage them as he pleases, but is for ever crampt, for fear that his own or other people's cattle should break into his corn or hay fields. In fencing,

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* Annals, vol. iii. page 480.

ing, he should determine to execute the work in the best manner, which is the plashing method. It is done in the following manner: the men first clear the old hedge of all the dead wood, brambles, and other irregularly growing rubbish, leaving along the top of the bank the straightest and best-growing stems of thorns, hazel, elm, oak, ash, sallow, beech, &c. about five or six in a yard; but if there are any gaps or places thin of live wood, on each side of such places they leave the more. When this work is done, they repair the ditch, which I should never advise to be less than three feet by two and a half, and six inches wide at bottom, in the driest soils; but in all wet or moist ones, never less than four by three, and one at bottom. All the earth that arises from the ditch is to be thrown on the bank. The men, if no bargain is made with them before-hand, will lay some of it on the brow of the ditch; but this must not be allowed, unless the ditch-earth happens to be extraordinarily rich, and to pay well for carrying it to the land, otherwise the grass of the border is spoiled, and the farmer is at the expence of carting earth which may be worth but little. When the ditch is finished, the men begin the hedge. Such of the stems left in cutting the old hedge as they find growing in the line where the new hedge is to run, they cut off three feet from the top of the bank, to serve for hedge-stakes to the new hedge. This practice cannot be too much commended; for these stakes being immoveable, and never rotting, keep up the new hedge, so that it never falls, or leans either way. In the next place, they drive in their dead hedge-stakes where wanted, choosing sallows or willows, that they may grow. The hedgers then plash down the remainder of the live wood left standing. They cut the stick twice, one stroke near the ground, and the other about 10 or 12 inches higher, and just deep enough to slit out a part of the wood between the two, leaving the stem supported by little more than the bark, or, at most, about a quarter of its first size. It is then laid along the top of the bank, and weaved among the hedge-stakes. All are served thus; and, where they are not thick enough to finish the hedge, dead thorns are wove among them; then the top of the hedge is eddered in the common manner.

The fence thus made, consists of a good ditch and a hedge, most parts of which are alive; that is, the stakes, and much of the wood woven between them. The importance of having as much as possible of the hedge alive, cannot be too strongly impressed. This management ensures a lasting fence; whereas, the hedges that are all dead, presently rot, and fall into the ditch. Those farmers who live in countries that know nothing of the plashing method, cannot give too much attention to teaching it to their men. The best way is, to send for labourers from the plashing countries,

tries, who, in one season, will easily instruct their regular men in the business, which they may afterwards perform without difficulty.

DITCHES.

In very wet soils, where draining is an essential improvement, and where the soil is a poor, loose loam, and not sufficiently consolidated, an evil that demands clay or marl, it is the custom of many farmers to dig ditches of much greater depth and width, for the double purpose of making better drains, and of raising clay or marl, wherewith to manure the fields. But I have heard other, and very practical farmers, object to this; urging, that the expence, when compared with marling from a pit, is more than doubled; for it costs more to throw it out of a ditch than into a cart, and, when removed, only two men can stand to fill: and, further, that for want of the greater depth to which pits are dug, the marl is neither so good nor so pure. These objections are powerful ones, and seem to authorize the farmer to reject any greater size of ditch, than the two purposes of draining and fencing demand.

DRAINING.

January is a proper season for draining. There are several sorts of drains; but I shall confine myself at present to the covered ones. There are two methods of making them; one by ploughs, which cut them either at one, or various furrows, according to their merit; another by digging with a system of spades, which work one after the other, so as to dig a drain about two inches wide at bottom, and of various depths and breadths at top. If a farmer occupies land that has no stones in it large enough to obstruct a plough, that implement is by all means eligible; for the expence of cutting the drains with a plough, is not so great as with spades. But it should be observed, that draining-ploughs can only cut the small drains; spades must be used for the main ones; their various courses and superior depths require manual work. Suppose a large field drained by parallel cuts of a plough, still the water must be carried out of those cuts by deeper drains dug, unless the land has a regular descent; but, whether the operation be performed by a plough, at a small expence, or by spades at a large one, still the necessity of the improvement for wet soils remains the same, and those who have had experience of their nature, will not regret the expence of performing the work effectually. Wet grass-lands are for ever over-run with rushes, and other aquatic rubbish; the hay of little value, and small in quantity. Arable land that is wet, can never be applied to a profitable purpose. It is too adhesive to be ploughed, when kindlier soils have received their tillage, and are sown. In wet seasons, the crops are too trifling to pay expences. Whatever attention is given to water-furrow them, still the land will not have that mellow, favourable nature, that enables it to yield advantageous crops.

The expence of covered drains may be estimated, on an average, at 3l. an acre, when done with spades. Now this expenditure will, in moderate cases, be repaid by the mere saving of the extra expence of water-furrowing, exclusive of all the superior benefits of it. Covered drains, dug 32 inches deep, two inches wide at bottom and 12 at top, and filled about 10 inches deep, may be completely executed at 3d. a perch, where labour is 18d. per day in winter. In respect to filling up these drains, the farmer must be guided by the circumstances of situation. If stones are to be had in great plenty, he should fill with them. Bushes, common faggot-wood, bricks, horns, and bones, turf laid in like a wedge, straw, fern, ling, stubble, &c. are all used in various places; and in *Essex*, where these drains have been made almost time immemorial, the farmers insist, that the great object is not durability of materials, but the arching of the earth, when the materials are rotten and gone. In many parts of that county, drains run well to this day, that were filled with nothing but straw more than thirty years ago. The extending such a practice should, however, depend absolutely on soil; for most certainly there are soils, in which it would be totally inexpedient.

A very economical way of doing this work is the following: first, the farmer ploughs four or five times in a place with his common plough, and then shovels out the loose mould; after which, on that smooth bottom, he takes one spit with a very long spade, about four inches wide at top, and narrowing to two at bottom; then with a scraper cleans out the moulds, and fills them up. Digging this spit is three halfpence a rod, and filling up a halfpenny. The newly-invented mole-plough will be mentioned hereafter.

BEANS.

If the autumnal sowing of Mazagan beans has been prevented by the weather being uncommonly wet, it ought to be done this month, for the earlier the beans are planted, the better will be the crop. And as the season must regulate the article of tillage in all cases, the farmer ought to sow his beans the first month his land is dry: some seasons will be dry in January, that were wet in December.

Beans are a crop that will pay very well for manuring; and if there are not many turnips, potatoes, &c. all the dung of the farm should be laid on for them, by way of a preparation for wheat; in which case the manure may be laid on at any time when it can be done previously to the ploughing.

CARROTS.

The best culture of carrots is to let the barley or wheat-stubble lie till you plough and sow, putting them in on one earth. If much previous tillage be given, the second earth will probably fall in this month. I mention this circumstance, in case the farmer is determined on much tillage, which for carrots I do not think advisable: possibly on very running sand, winter tillage might be beneficial.

POTATOES.

The above observation is also applicable to this root. There may be cases in which a ploughing in January may be advisable; but in general the land should either lie till the planting, or at least have only autumnal tillage.. In dry soils, upon which weeds have come up since that time, a ploughing now may be right. If the dung designed for the potatoe land is laid in the field ready for it, and the weather happens to be frosty, the first opportunity may be taken for carting it on, especially if the land is wet enough to make a frost necessary.

WOOD.

There are not many districts in which woods are profitable to a farmer to hire; but when he finds them a part of a farm, it is not always that he can have a choice whether to take or leave them, and must therefore apply himself to convert them to the best profit. This month is generally a busy one in felling: the men who do the work are commonly paid by measure, or tale. In some countries the falls are only cut and laid in rows, and sold in that manner by the rood; in others, the farmer converts the stuff to the proper use, and sorts it into faggots, poles, hoop-stuff, or hurdles;

and this, I believe, will generally prove the most profitable way.

In cutting woods there is one point much disputed, which is, the number of years' growth at which to cut. Customs vary from nine years to twenty-seven, but generally about twelve or fourteen. I have seen many woods, in cutting which, one stem on a stool was left, to be of a double age at next cutting, in order to have some large wood in each fall. The question is, whether such stems draw from the root so much nourishment as to lessen the young growth as much as the large shoots amount to? From viewing such woods, I have observed, that the part of twelve years' growth, among which were some stems twenty-four years old, was as good as others, where the whole was only twelve. If so, the additional growth is nearly all profit; but if not, it certainly makes the wood when cut more saleable, and applicable to more purposes.

One great point to be attended to in the management of woods, and to which too much attention cannot be paid, is to keep the fences in the very best order possible; for a farmer or landlord had better let cattle into their wheat than into their underwood; because their biting and mangling one year's shoot, is doing mischief to the amount of at least three years' growth. But if woods are so ill fenced and so extensive, as to be too great an expence for the person to afford repairing; in that case, the longer the growth is, the greater will be the profit; for supposing that cattle, upon an average, eat three years' growth, then there are three in twelve or fourteen destroyed; whereas, if the term is twenty-four years' growth, still there are but three destroyed, which is doubly advantageous. These are points which should be well considered; and also what is the age at which the various sorts of underwood attain the greatest weight; having always in view the variations of soil. For instance, it should be tried, what weight twenty single stems of sallow, ash, oak, hazel, hornbeam, &c. come to at six, twelve, and twenty-four years' growth, to see whether the produce is proportioned to the age. This would be a very easy experiment in every respect, but that of the time it would demand.

In the beech woods of Buckinghamshire, this system is carried exceedingly far; for they are not cut till thirty or forty years' growth; the consequence of which is, they are destroyed as underwood, and nothing appears but single stems, which are successions of young trees. The way of cutting them is not by falls, as in common woods, but by singling out, every year, the largest of the trees, and cutting enough of them to pay 12s. 15s. or 20s. per acre, per annum, according to the goodness of the wood. These trees, though some of them when cut would more than measure as timber, are all sawn into lengths of four feet, or thereabouts, and rived into billets for fire-wood, for the London market, being conveyed there by the Thames.

Good beech woods, upon this system, will pay 20s. an acre, clear of expences, which is more than underwood would pay upon the same soil. I believe it will generally be found, that the older the growth the greater will be the profit. At twelve years' growth of ash, the land must be very good to have a crop of hop-poles; but at twenty years' growth, you will have very fine ones, and pay yourself much better than by the younger growth.

Some woods are so very wet, that the ash, hazel, hornbeam, and oak stubs, will not thrive; in that case, the sallow and willow should be multiplied, or the wood hollow-drained; which is a practice beginning in some parts of Essex. There they have so long seen the advantages attending drains of that kind, in their corn and grass lands, that they now think their wettest woods will pay as well for them as an arable field. It cannot be doubted but the practice must be exceedingly advantageous; and this month is a very proper time for doing it.

THE MOLE PLOUGH.

The accounts which have for the last two or three years been received, of the effects of this implement, are extremely contradictory. With some farmers the use of it has been great, and the duration of the drains extremely satisfactory; with others the reverse. I have attended to these circumstances in various districts, and have employed the tool on my own farm, and from all I could observe or hear of it, the effect seems to depend entirely on the soil. In clay the result has given much satisfaction; but in loose spungy loams, however wet, and where sand *gauls* (as they are called) abound, the drains have generally stopped. A young farmer should therefore acquaint himself well with his soil to the depth of from 14 to 18 inches; for if he has not a pretty regular stratum of clay, or stiff marl, he may expect the pipes to fail in two years; whereas in stiff soils, those are running well at present that were made six or seven years ago.

Another remark that should be made, relates to the strength of the draft. Without wheels, the mole plough demands 10, 12, and even 14 horses; these, when the land is wet, do almost as much mischief in trampling as the drains can do good. The addition, therefore, which has been made to this implement, of wheels before and a roller behind, is of essential importance, and reduces the team to six or eight horses. It is certainly an excellent tool, if well applied.

A precaution, which should be mentioned here, is, on grass-land, to open a furrow with a good common plough, or better, with an open-furrow drain plough, in order that the mole plough may follow and finish the work by turning back the furrow. This defends the slit from the frost, which otherwise is apt to moulder down the earth, to the hazard of stopping the drains.

A capital improvement has been made on the mole plough by Mr. Lumbert, of Gloucestershire,

which

which is that of substituting the force of eight women turning four windlasses instead of horses. Also of one horse which acts with the power of twenty. My neighbour, Mr. Plampin, has given an exact account of the work of this implement, in the 45th volume of *Annals of Agriculture*, to which the reader would do well to refer, as well as to my own account of the woman mole, in the 42d volume. By this method all poaching is precluded, and the expence at the same time much reduced; for he drains for any person at three halfpence per perch, of which the half is profit to himself for the use of his plough; his foreman contracting for the labour, including his own time, at three farthings.

The state in which land should be for draining, admits but of one question, the right moment for applying the Essex method of hollow-draining? With respect to this, there is a diversity of opinion, and, perhaps, with some propriety, it being a point on which something may be advanced on both sides. As to all other circumstances, such as the greater exertions of large open drains; the brick soughs of Mr. Elkington, &c. they should be unexceptionably performed previously to all tillage; an assertion which many practical reasons support. They imply a degree of wetness which would be ruinous in tillage, and as that wetness commonly proceeds from powerful springs, much carting and trampling could not be permitted after ploughing, even in summer, without essential mischief.

Another object in extensive works, especially on moors upon the slopes of hills and in mountains, is the union of draining and irrigation. The general mouth of many drains may, in numerous cases, be made the constant supply of a system of watering the land below it. Till this is settled, the improver is uncertain what land it will be advisable to break up, and what otherwise to improve by water, for it may be laid down almost as a maxim, that water, where it can be had, should be tried with mere levelling before any other method be attempted.

Upon the high moors to the south of Paitelybridge, in Yorkshire, there are some remarkable instances of small abandoned mill-courses having overflowed the ling moor below them, and thereby destroyed the ling, and established a large family of grasses, converting black into what they call *white land*, and which, though (like all the rest of the moors) in a state of utter neglect (this accidental circumstance excepted), would let, with a wall fence around it, at 10s. an acre, instead of 6d. or 9d. When the effect of water is so remarkable, it is a proof that not a drop should be lost, but that what comes from the drains should be converted from an enemy into a friend.

It is the practice of many farmers to choose the year of fallow for this work, because they think it is better done in summer than in winter, and while the land is in fallow than when under clover, though that clover be fed. If this be really the fact, it probably depends not only on the land being dry, by which means it admits carting the straw and bushes, but also because the sun and air have the effect, by drying the earth of the sides of the cuts, to avoid that plastering which the action of the spade has in digging them in wet weather, and by which they are apt afterwards to bleed through the pores less freely. There may be something in this. Other farmers do the work in winter, partly because they have a better opportunity, on flat fields, of seeing how the drains *draw*, as it is termed; and partly because, at that season, labourers are easier to be had. But poaching the surface upon arable land is an objection. It seems on every account to be desirable, that such soils as well as others, and whether the work be done in winter or summer, should be drained while in grass, by which means poaching is avoided; and if the surface turf be tough, it gives an opportunity of making sod-drains, which are cheaper than filling them either with bushes or straw.

MARLING.

The marl and clay carts may work all this month. This is so important an object, that too much attention cannot be given to it, nor can a great breadth of land be thus manured, if the teams and men assigned to it be not employed regularly the year through. Upon dry soils no difficulties occur, but upon wet ones the teams can stir in winter, only while the surface is frozen, unless it be on *layers* of some years standing, and well drained.

Upon sand, marl or clay should be laid on in the proportion of 50 or 60 cubical yards per acre; but on loose wet loams, upon which clay or marl works a very great improvement, it should be laid on to the quantity of 100 yards. The cheapest way of doing it, is to contract for the whole job with some little farmer, or horse-keeper, who works for hire. In Suffolk, it is not uncommon to give 8d. to 9d. a cubical yard for all expences whatever, except spreading, which accurate farmers choose to do by the day, as a minute attention is in nothing more important. If this be not well executed, some spots in the field will have in the proportion of 200 loads, and others not more than 50.

If the young farmer wants any inducement to undertake the work of marling, it will be best found in the register of what his brethren have done.

Mr. Rodwell's account of this operation is very interesting.

"My operations at first, were to inclose with thorn hedges, marl or clay, and break up 300 acres of the heath; and in the first seven years of the lease, I finished what I meant to improve in that term. I marled or clayed 600 acres, at 70 loads an acre, being 42,000 large tumbril-loads. In this work I employed three teams, two of my own, and one I hired for several years. It is severe work, and the second year I lost nine horses, attributed to feeding on pea-straw from the new broken heath; a circumstance that deserves the attention of improvers.

"In the eleventh year of my lease I applied to my landlord for a renewal; on which the farm was valued again by Mr. Hare, the surveyor at Peterborough, and I took a fresh lease of 15 years, to commence at the termination of my old one, at the rent of 400l.

"I immediately clayed and broke up 200 acres more, at 100 loads an acre, 40 bushels per load, inclosing all with quick hedges, and ditches five feet wide and four feet deep: after this I improved 100 acres more in the same manner.

"In the two leases of 28 years I clayed or marled 820 acres; and I have clayed or marled so much over the second time, at 70 loads an acre, that the quantity I have carried in all, is very little short of 140,000 loads.

"Upon taking a third lease, I was, in 1798-9, particularly steady to this work, and in 49 weeks and three days carried 11,275 cubical yards, paying by measure of pits, and not by loads, which were filled and spread by four men and a boy, and carted by six horses and two tumbrils.

"In this business of carrying clay or marl I have practised hand-barrowing. The men can make good earnings at 10d. per yard, wheeling it 30 rod; and down to 7d. a yard at shorter distances; and I am much inclined to think, that if we had workmen used to the operation, and handy at it, like those employed in navigations, that this method would be of all others the cheapest, especially on heavier soils. But by far the greatest part I have done by tumbrils, the expence of which put out is 5d. per yard for team, and 2¼d. a yard for labour; this, with paying for laying picks, wedges, &c. also for stones that rise, increase the whole expence to 8d. per yard, which is at least a halfpenny per yard cheaper than I can do it with my own teams; the reason of which is, that the man who contracts with me drives his own horses, and looks after them. At 8½d. per yard, 140,000 yards have cost me 4958l. excepting the small proportion *hired* at a halfpenny a yard lower.

"I come now to mention a few circumstances, which I hope may tend to render this paper useful to others not having the experience which I have acquired: I shall use but few words, but they shall be founded on positive experiment or attentive observation.

"Clay is much to be preferred to marl on these sandy soils, some of which are loose, poor, and even a black sand. By clay is to be understood a grey clayey loam, some of it brick earth, and all has with vinegar a small effervescence. Marl is a white, greasy, chalky substance, that effervesces strongly with acids: I make a universal rule, on a second improvement, to lay clay on the fields marled before; sometimes marl where clay was spread before; but this not general, as clay answers best on the whole.

"On 90 acres, clayed 100 loads an acre, I have had, after two crops, the one turnips, the other barley, cole-seed, and sold it on the ground for 1000 guineas; then turnips, a famous crop, followed by barley, on 75 acres, 16 coombs an acre (the coomb is half a quarter); and by oats on 15 acres (poorer land), 10 coombs an acre. These crops are, for the soil, *great*; but in general my products have been highly to my satisfaction."

Since this account was written, I have heard of 10d. per yard being given in Suffolk, to induce a little farmer to set up a team strong enough for the work.

DRAW CHALK.

"The method pursued in Hertfordshire in chalking land is this; and the persons employed therein follow it as a trade: a spot is fixed upon, nearly central to about six acres of land to be chalked. Here a pit, about four feet in diameter, is sunk to the chalk, if found within twenty feet from the surface; if not, the chalkers consider that they are on an earth pillar; fill up the pit, and sink in fresh places, till their labour is attended with better success. The pit, from the surface to the chalk, is kept from falling in by a sort of basket-work, made with hazel or willow rods and brushwood, cut green, and manufactured with the small boughs and leaves remaining thereon, to make the basket-work the closer. The earth and chalk are raised from the pit by a jack-rowl on a frame, generally of very simple and rude construction. To one end of the rowl is fixed a cart-wheel, which answers the double purpose of a fly and a stop. An inch-rope of sufficient length is wound round the rowl; to one end of which is affixed a weight, which nearly counterbalances the empty bucket fastened to the other end.

"This apology for an axis in peritrochio, two wheel-barrows, a spade, a shovel, and a pick-axe, are all the necessary implements in trade of a company of chalkers, generally three in number. The pit-man digs the chalk and fills the basket, and his companions alternately wind it up, and wheel its contents upon the land: when the basket is wound up to the top of the pit, to stop its descent till emptied, the point of a wooden peg, of sufficient length and strength, is thrust by the perpendicular spoke in the wheel into a hole made in the adjoining upright or standard of the frame, to receive it. The pit is sunk from twenty to thirty feet deep, and then chambered at the bottom; that is, the pit-man digs or cuts out the chalk horizontally, in three separate directions; the horizontal apertures being of a sufficient heighth and width to admit of the pit-man's working in them with ease and safety. One pit will chalk six acres, laying sixty loads on an acre. If more be laid on, and to the full extent of chalking, viz. 100 loads, then a proportionable

able less extent of land than six acres is chalked from one pit. Eighteen barrowfuls make a load, and the usual price for chalking is 7d. per load, all expences included; therefore the expence of chalking, at sixty loads per acre, is 1l. 12s. 6d. and at 100 ditto, 2l. 18s. 4d.

"As the chalk is considered to be better the deeper it lies, and the top chalk, particularly if it lie within three or four feet of the surface, very indifferent, and only fit for lime, or to be laid on roads, gateways, &c. the chalkers must be directed to lay by the chalk for the first three or four feet in depth, to be applied to the above purposes, or if not wanted, to be again thrown into the pit when filled up; and also to pick out the flints from the chalk before it is carried on the land, for if they are not narrowly watched, they will chalk with both.

"Mr. John Hill, of Coddicot, farms upwards of 1200 acres in the adjoining parishes of Coddicot and Kimpton, a considerable part of which is his own estate. He has chalked many acres of land, and approves much of the practice. He chalked a field of strong clay-land in the autumn of 1793; laid on sixty loads to an acre; and the chalk where the pits were sunk lay about ten feet from the surface. I viewed the field the 7th of August 1794; it had borne a crop of pease since it was chalked, and was then under the plough, preparatory for a crop of wheat. The chalk was good, and the land appeared to work well, though the chalk was not then thoroughly incorporated with the soil. Mr.

Hill never lays on more than sixty loads of chalk an acre: this, he finds, will not only make the land work much better with less strength of cattle, but also, with a light coat of dung, or spring dressings occasionally laid on to quicken the vegetation, produce abundant crops for ten years; he then chalks again with equal success."—*Mr. Walker.*

The firmness of chalk in its bed, renders this mode of excavation safe; but with marl and clay there would be great danger to the men, if it were attempted without some effective precautions; and it well deserves attention what these might consist of, as the substitution of this barrowing system to that of teams, would be highly advantageous on wet soils, which are so liable to damage by poaching.

EXAMINE WATER-FURROWS.

At this season, if snow melts, all water-cuts made in autumn for keeping arable fields dry, should be carefully examined, to see that leaves, weeds, frozen snow and ice, do not impede the passage of the water, and overflow the stitches. If this be neglected, mischief may presently occur; and nothing demands, in this respect, more attention than young clover and other *seeds.*

BURN LIME.

If a farm affords the opportunity of burning lime, and experiments made for the purpose, or common practice, have proved its efficacy, it is a business which may go on through all the winter.

Perpetual kilns are not uncommon in Ireland, which have burnt through the entire year, coal or culm being the fuel, in layers, between others of broken stone. They are best situated on the slope of a hill or mountain, for ease of conveying the stone to the kiln, and for drawing out the burnt lime at bottom. Sheds, or stores, should be conveniently situated for receiving it, that it may be kept from the weather, if preserved any time before using; as in many cases it should be used unslacked. The common way is to contract with the burners, for quarrying and burning, by the quarter hogshead or bushel. In that case, the chief attention to be given, is to see that the coals delivered produce a proper quantity of well-burnt lime.

LIMING.

Should lime burnt in January, be used when burnt or kept till the spring? There are two motives for burning stone or chalk: one is, for the sake of reducing the material to powder, for accuracy in spreading; the other is, for the application of a caustic body destructive of living vegetables. For the former purpose, the lime had better be kept; for the latter, it is usually laid on in such large quantities, that it is not very material at what season it is spread, provided it be done fresh from the kiln. It will have a greater effect in spring and summer, but the superiority is not such as to induce delay from a time in which the teams have little to perform, to a season in which there is much work for them.

The grand effect of this manure is on uncultivated waste land. On moors, mountains, bog, and boggy bottoms, the effect is very great, but the quantity applied considerable. The more the better. In Derbyshire, as far as 600 bushels an acre have been used, and even to 1000; or 33 one-horse cart-loads of 30 bushels: such a dressing, when the space to be improved is large, demands the employment of regular teams to be kept continually at work. In such undertakings, it is idle to be nice about the season of applying the manure; convenience demands that the work should go on at all seasons, but in the English counties where lime is most used, the common season is summer, and on fallows.

MOUNTAIN IMPROVEMENT.

Throughout this month, if the snows be not very deep and falling, quarrying stone, and building walls, may proceed; but the stones must have been provided and laid ready for the latter. In some high districts, where there is much snow, carting cannot be executed. The improver will have no difficulty in knowing what he can, and what he cannot execute; but every work should be in his mind, that no days be unnecessarily lost. He who can contrive to employ most hands through the year, will do his work cheaper than if he were not regular in his employment.

TOWN MANURES.

It is not very easy to give advice to a young farmer touching this article, because experiments for ascertaining the value of these manures have been few, and not varied sufficiently to afford adequate information. I was largely in the practice myself, very early in life, when they were much cheaper than they are at present, and left it off from an idea (but not founded on experiment), that it did not answer, induced very much by the cheap price at which I could then buy straw. Several farmers with whom I have conversed on the subject, have been of opinion that it answers when the horses have nothing else to do; but that it will not answer at any other time; that for back carriage it answers, but not otherwise. This confines the object so much, that it becomes no longer a matter of great consequence. The grand question is, will it answer to set up a team for that purpose only, and to keep it the whole year at work, upon the same principle that teams are thus set up and employed in marl-carting? This is an object for the young farmer to calculate; and the mode of doing it is this, supposing three one-horse carts employed:

Price of three carts and harness, ...	£.42	0	0
Price of three horses, ...	90	0	0
	£.132	0	0

Charge interest for this sum, at ten per cent.	£.13	4	0
Keeping three horses a year, ...	60	0	0
One man and two boys, at 17s. a week, 52 weeks, ..	44	4	0
Three hundred days work, 900 loads, at 2s.	90	0	0
Allowance for beer, turnpikes on some roads, and sundries, 1s. 6d. a day, ...	22	10	0
	£.229	18	0

Supposing them to bring each a ton weight, according to the various authorities in Scotland, 900 tons cost this sum, or about 5s. per ton.

This might probably answer; but suppose four horses in a waggon, and to bring the common load of a waggon (not nearly that of carts, proportionally to the team), the expence would be so increased, that I do not conceive it could answer.

However, in all these cases, where carriage runs dear, the more valuable manures should be brought, such as soot, ashes, malt-dust, night-soil, bones, rape-cake, rabbit-dung, &c. in which the carriage bears but a small proportion to the total expence. It must be remembered by the young farmer, that all these speculations evidently demand a large capital, which he should carefully calculate before he enters into them.

WATERED MEADOWS.

Mr. Wright directs that the floater should take care in this month to keep the land sheltered by the water from the severity of frosty nights. It is necessary, however, every ten days or a fortnight, to give the land air, and to lay it as dry as possible, for the space of a few days. Whenever the frost has given a complete sheet of ice to a meadow, it is advisable to discontinue floating, for the frost will sometimes take such strong hold of the land, as to draw it into heaps, and injure the evenness of the surface. Attention is also to be paid to prevent the equal distribution of the water being obstructed by the continual influx of weeds, leaves, sticks, &c.

CARTING TURNIPS.

If a farmer occupies land which is not suitable to feeding sheep with turnips where they grow, it is of very material consequence so to arrange the lands, stitches, or ridges, as to be able to cart off the crop with as little damage to the field, that is, with as little treading and poaching, as possible. To avoid this evil, is a point which should be particularly attended to when turnips are drilled or sown. In the Calendar for June and July, this subject will be particularly treated. As the wheels of carts are five feet four inches asunder from centre to centre of the felſies, this demands drilled turnips to be in double or treble rows on ridges of that breadth, for two horses working double, or for one horse in a quarter cart; or single rows on ridges of 32 inches. In either case, the wheels and horse move only in the furrows, and consequently do as little damage as possible, and that only at the bottom of the ridge-furrows. Throughout the winter, especially if it be a wet one, the great use of this precaution will be found.

CARTING CABBAGES.

Cabbages will of course be planted with an eye to the same circumstance: the ridges so arranged, as to admit carts to move, as for turnips, in the ridge-furrows only. In carting both turnips and cabbages, attention should be paid to the men, for preventing all movements *across* the ridges, that they turn from the gateway along the border till they come to the ridges whence the load is to be taken.

FELL ASH.

If February should prove a forward month, ash timber had better be felled in January than delayed longer: this note upon a supposition that the farmer occupies his own land, and employs a wheelwright constantly, which I have found to be a cheaper plan than employing others in the common way. If elm abounds on the farm, this is the season to fell that also; and the aquatic timbers likewise.

WINTER EVENINGS.

Some readers may smile at this title in a Calendar of the business of a farm; but if they do, it will be for want of due consideration. In fact, there is no part of the day can be more profitably employed. Every work for the next day is to be arranged, whether for fine or rainy weather, and the farm-books to be made up for the transactions of the past day. Besides these, he should have another book, for miscellaneous observations, queries, speculations, and calculations, for turning and comparing different ways of effecting the same object, for estimates of the different kinds of food he may have it in his power to give to the same cattle; with all such inquiries, doubts, or propositions, worth attention, as he may have heard in conversation. Loose pieces of paper are generally lost after a time, so that when a man wants to turn to them to examine a subject formerly estimated or discussed, he loses more time in searching for a memorandum, than would be sufficient for making half a dozen new ones; but if such matters are entered in a book, he easily finds what he wants, and his knowledge will be in a much clearer progression, by recurring to former ideas and experience. Formerly farmers never read books of husbandry: many do read them now; and there are few that will not furnish very valuable hints. These should be noted, that when an occasion offers, use may be made of them. Such an employment of a winter evening, is a very different one from spending it at a public-house, in the same company over and over again, which, after a time, becomes a pump that yields no water.

TRAVELLING.

The reader may also be surprized to see such an article as this in a Calendar of the business of farming; but were I to name one circumstance which has, in the last twenty years, advanced the husbandry of this country more than any other, I should fix on the practice of farmers *taking their nags* (to use an expression of Bakewell), *to see what other people are doing.* Men who are confined their whole lives to one spot or vicinity, necessarily contract a too limited range of thought. Their ideas flow so much in the same channel, and dwell so much on the same objects, that new ones, however useful, make too faint an impression: nor can they know what is doing by the best farmers, on soils perhaps exactly similar to their own. To take a ride, for a fortnight, through four or five hundred miles of country, with an eye scrutinizing every thing they see, and calling upon noted farmers to make inquiries about such objects as appear interesting, must necessarily give a new movement to their minds, a new spring to thought, and remove many prejudices. If only one journey be taken in a year, and that at a vacant time, perhaps June would be the best season; but, as I propose that two should be taken, one may as well be in January as in any other month. This season will explain the winter management of live stock, the important objects of the farm-yard, fattening beasts, sheep-feeding in many branches, winter irrigation, and many other

objects,

objects, which are truly interesting. A farmer may take such a ride, at the expence of as many guineas as he is out days, and he will not find this money the most unproductive that he expends.

OATS.

Early in this month, if the weather be open, the young farmer may examine such fields as he intends sowing with oats, that he may consider if he has any apprehension of having his hands full of business in February and March, whether he should not lessen the work of those more busy seasons, by sowing some oats now. The temper of the soil must govern him: but it is necessary that he should know that oats sown so early succeed well, as will appear from two very important experiments, one made by the late Mr. Macro, of Suffolk, and the other by the present Earl of Winchilsea. The former observes: "Having tried early and late sowing of barley, in the year 1784 and 1785, I had a mind, the following season, to try the same experiment with white oats; and began by sowing one acre, in December 1785, with one coomb of seed, harrowed in upon a wheat stubble, with one earth.—Value of land 10s. an acre.

"In January 1786, I sowed exactly another acre by the side of it, with the same quantity of seed, and dressed it in the same manner. In February, another acre the same, except half a bushel *less* seed. In the beginning of March I ploughed the remaining part of the piece of land a second time; and, about the middle of that month, sowed it, at the rate of three bushels of seed an acre, ploughing in one cast, or half the seed, and harrowing in the other half; and marked out another acre for the experiment. This last acre had three clean earths.

"Produce of the four acres:

	C.	B.	P.
On that sown in December,	8	2	0
January,	8	3	2
February,	6	2	1
March,	6	2	2

Or seed deducted:

	C.	B.	P.
On that sown in December,	7	2	0
January,	5	3	2
February,	5	2	3
March,	5	3	2

"That sown in December, though it came up thick enough at first, lost so much of its plant by the winter frosts, that I expected it must have been ploughed up, and sown again in the spring; but observing the plants that were alive, beginning to flourish very early, I gave them time; yet it never got to be a full plant, nor did I expect, though the straw was very stout, and the hawes, or ears, very fine ones, that it would have turned out so well. Those sown in January and February both lost some of their plants, so that that sown in March, *with the least seed*, was the fullest and evenest plant of any."

The Earl remarks: "I was induced to make the following trial, from having seen upon two very capital farms in Kent and Essex, great crops of oats, sown as early as Christmas week, and from being informed by the gentlemen who occupied those farms, that they always sowed their oats as early as that, if the season admitted of it; and that they thought it the best time for sowing that grain. I wished to ascertain whether this plan would answer in this more northern county. The general time of sowing oats here, is from the beginning of March to the end of April; and it is the opinion of most people here, that oats sown much earlier would be liable to be destroyed by spring frosts. Last winter was very favourable for the experiment, as the weather was open at Christmas for sowing, and the frost in the spring not severe. I divided a field of eight acres equally: one half was sown the day after Christmas day; the other half the middle of March. Five bushels per acre were sown broadcast on each part, and the same oats: the sort a small white oat, here called short-smalls. The early sown were ripe and cut one week before the others; they were harvested equally well, without being exposed to any bad weather. I had a rood of each set out very carefully in the middle of the field, reaped and thrashed as soon as carried. The produce and weight were as follow:

	Winch. Bushels.		*Qrs.*	
Early sown, ...	22	.... per acre, ...	11	0
Late sown, ...	19	.... do.	9	4

"Weight per Winchester bushel as soon as thrashed:

Early sown, ...	44½ lb.
Late sown, ...	42½ lb.

"The crop was, as you see, very good. The land yielded potatoes the preceding year, 450 bushels per acre, and was not manured for that or the oat crop: it had before that been in grass for six or seven years. The soil a red loam. I am inclined to think that the early sowing will answer here, as this field is very high and much exposed."

FEBRUARY.

BEANS.

IN this month a farmer should begin to sow his bean crop, and, if the soil and the season agree, finish it if possible; for later sown crops will not succeed so well. The land ought to have been ploughed on to the three-foot ridge, and well water-furrowed the autumn before; by which means his only object now will be dibbling in the seed: so that the *first* dry season may be taken. To get the bean crop in the land in February is an object of consequence, if the soil is dry enough.

As to the methods of sowing, there are many. Some farmers sow the beans over the land, and plough them in; others plough first, and harrow in the seed; and these both on ridge and flat work. A better way is, either to half plough the ridges, sow broad-cast, and afterwards finish; or to sprain them by hand before the plough, so that they may rise in rows, on the tops of the ridges. In the latter way, they are in single rows, but in the former double. In the following summer, the single rows are ploughed between, in the horse-hoeing manner, and the double ones hand-hoed. Both methods are common husbandry in several parts of the kingdom. But I shall recommend, in preference to them, other methods, and using a drill plough, as it executes that work with much greater accuracy than any hand can do. Light drills may be had to wheel along the ground, like a wheel-barrow. The use of such an instrument will save money, at the same time that it performs the work better. A farmer who has land proper for beans, should, on no account, avoid giving a particular attention to that crop; for it will prove one of his surest funds of profit. By means of beans, he may be able to lessen, if not to banish, the custom of fallowing; for a crop of beans, rising in single rows on three-feet ridges, or double rows at one foot, on four-feet ridges, give so good an opportunity for ploughing the intervals, and also admits hand-hoeing the rows, that the land may be cleaned as well as by a fallow, and the crop succeeded by corn. But if the soil be in such order that this culture is insufficient to clean it, then a second crop of drilled beans should succeed, which will be very profitable husbandry, and cannot fail of bringing the land into order. Whenever beans are cultivated with this view of substituting them in the room of a fallow, the farmer should absolutely determine to drill or dibble them, so as to admit the plough or horse-hoe between the rows; for no hand work will clean and pulverize the land sufficiently for this purpose, at least without an expence too great for the object. If the spirited husbandman calculates the expence of a summer fallow, and also the account of a drilled bean crop, he will find the necessity of this culture. Beans do very well on loams, and on lighter ones than commonly imagined; but on light gravels, sands, &c. more profitable crops may be substituted. Let the farmer remember the general maxim, if he ploughs for beans this month, never to allow his ploughs to stir while the land is wet: if his horses poach at all, or his ploughs do not go clean through the land, he will lose, or greatly damage his crop. But improvements, and especially those which have taken place in Middlesex, but most of all in Suffolk, have opened a new field for this cultivation, which will be explained in this work. The grand basis of it is, to banish spring ploughings, by laying the land ready in autumn, for either dibbling or drilling.

BEANS AFTER BARLEY.

The barley stubbles intended for beans, or land whereon clover failed, having been ploughed into the proper stitches, and laid dry for winter, are now ready for drilling or dibbling. It will probably be the end of the month before the season is suitable for this work. The same attention must be paid to this crop, as to barley, in respect of avoiding spring ploughings, and also to effect every operation without permitting the horses to set a foot *on the land.* They are ever to move, in spring, only in the furrows. As this is the first month for putting in beans, it will be proper for the young farmer to consider, whether he shall adopt the system of drilling or of dibbling, setting, or planting,

ing, as the operation is in different districts differently termed.

Dibbling is an excellent method, when well performed; but the grand objection to it is, the difficulty of getting it well done. When it becomes the common husbandry of a district, the workmen find that great earnings are to be made by it; and this is much too apt to make them careless, and eager to earn still more; and if a very minute attention be not paid to them, by the constant attendance of the farmer, they strike the holes so shallow, that the first peck of a rook's bill takes the seed, and acres may be destroyed, if the breed of those birds be encouraged as they ought to be. Boys are employed for weeks together, to keep the fields, but all works that depend on boys are horribly neglected, and thus the farmer suffers materially; but if the seed is deposited two and a a half, or (better) three inches deep, it is not so easily got at. The imperfect *delivery* of beans by all the drill-machines which I have seen, causing many gaps in the rows, is an additional motive to dibble. But, on the contrary, the power to put in the seed at the desired depth, with the drill, is a great motive to use it; nor should the difference of the expence be forgotten. To dibble beans well, at eighteen inches equi-distant, will cost 5s. an acre; but drilling will not come to the half of that sum. On layers whether of grass or clover, I prefer dibbling, because, on such, it is easier to deposit the seed at a safe depth, by the dibble than by the drill, unless it be on clover of one year, ploughed with Mr. Ducket's skim-coulter before winter, and left for frosts to work upon. On such, the drill will work well. This is, however, a point that must be left in some degree of latitude. No general rule can safely be laid down: the farmer must judge according to soil, season, his dependance on dibblers, and other circumstances: both methods, when well applied, are good.

The dibbled crops demand harrowing with fine, light, short-toothed harrows, which will not displace the seed, and it should be carefully done, in order to hide the holes from rooks. The drilled crop wants only one light harrowing, to smooth the land.

In putting in beans after barley or wheat, on land ploughed in autumn, the farmer must remember, that if the frosts have had full play, the surface will probably be in such friable order, in a dry February, that he *must* drill, as the mould would run in, if dibbled, and fill the holes before the seed is dropped. This is a circumstance that will sufficiently explain itself.

There is a practice about Coggeshal, in Essex, that should here be noted. Their course is,

1. Fallow,
2. Barley,
3. Clover,
4. Wheat,
5. Fallow,
6. Barley,
7. Beans,
8. Wheat.

Designed, probably, to throw the return of clover to the eighth, instead of the fourth year.

The barley stubble of the sixth year is dunged in autumn, with farm-yard composts, and ploughed after wheat-sowing is finished, on ridges of three feet; two-bout ones. In February, they dibble a double row of Windsor beans on the crown of each ridge, nine inches from row to row, which leaves an interval of twenty-seven inches for cleaning. They are exceedingly deficient, in not horse-hoeing so wide an interval, applying the hand-hoe only; but they do this three or four times; and, if the stubbles are in the least foul, they are very attentive to hand-hoe them for the wheat which succeeds. Their avoiding spring-tillage for the beans has much merit. This practice they carry so far, as neither to scarify, nor even harrow, putting the seed into the frost-worked surface, and their success is a justification of the system.

SORT OF BEAN.

The common little horse-bean has the advantage of all others, in being more generally marketable; for in certain situations, it is not always easy to dispose of ticks, Windsors, long-pods, and various other sorts. They also grow higher, shade the ground in summer more from the sun, and yield a larger quantity of straw, which makes excellent manure. But some of the other sorts are generally *supposed* to yield larger products. This, however, is a point in which some well-conducted comparative experiments are wanting.

SOIL FOR BEANS.

Every one knows, that all the sorts of strong and heavy soils are the common ones generally applied to this crop. In Kent they wisely cultivate them to great extent, upon rich dry sound loams; but it is not generally known, and very rarely practised, to venture them on light turnip loams and middling sands. I have, however, seen them succeed so well on such, that a note of it ought to come into this work; and as this is the month in which a farmer will first turn his thoughts to beans, it deserves his attention to consider, whether he has not land upon his farm which would do for that crop, although he never before thought of venturing it. The soundness of a man's farming practice may be judged of by this cultivation, as well as by any other criterion; for he ought to have beans wherever it is possible to have them. They do not exhaust the soil—they prepare it better for wheat than any other crop—they stand erect to harvest, admitting horse-hoeing to the last; they shade the ground from the sun, and the straw is valuable, if harvested in a favourable time, or, if not so harvested, makes excellent dung. The favourable circumstances attending this crop are so many, that every man who can have them, ought to determine on the culture. A bad crop of pease fills the land with weeds, but a bad crop of beans may be as clean as a garden. Some of the greatest products of this plant, which I have seen, were on a rich sand; but I have known beneficial ones on a sand of 10s. an acre. Beans are never seen in Norfolk, on sands that lett from 10s. to 15s. and even more per acre; and this is a deficiency in their husbandry.

QUANTITY OF SEED BEANS.

The quantity of seed will depend much on the distance at which the crop is drilled or dibbled. It takes about two bushels of horse-beans to an acre, the rows equi-distant at 18 inches; and it demands six bushels of Windsors, put in in the same manner.—The quantity of seed proper for other varieties, will necessarily be in proportion to the size of the grain; and the variation of distance in the rows, will demand seed in proportion to these quantities for the distance named. It is in almost every case better to put in a peck too much than half a peck too little.

THE ROWS OF BEANS.

Beans are drilled from 12 to 24 inches, equidistant. In Suffolk, by many farmers at 12 inches; but, on good land, they will then be evidently too thick, and draw themselves up, without podding below. Eighteen is a better distance, and used by the best farmers. In Kent, 14 and 16 inches is the distance adopted by many. In Essex, I have just stated double rows at nine, with intervals of 27 inches. I have had great products on layers, from double rows, at nine, with intervals of 18, and also 27, that is, two *flags* planted and two or three missed, for intervals; the former, viz. the double rows, with intervals of nine and eighteen inches have, I think, been most productive. But this point will entirely depend on the fertility of the soil; for in proportion as the land is rich, whether from Nature or from manuring, the distance should be large.

In Berkshire they have a custom, which, in this respect, varies from all other countries with which I am acquainted: it is, to plant in clusters four or five beans in a hole, and nine inches from hole to hole; the space between the rows varied according to soil. Their crops are large. This method admits effective hand-hoeing in the rows, and the intervals are horse-hoed. It may be combined with *de chateaux vieux* well-known experiment on planting barley in clusters, which seems to have been very carefully made, and in which four, five, or six grains in a hole, produced more than the same number of grains singly, in as many holes as grains. It is in vain to reason about such results; but it appears as if the germination of the grains, in such close contact, caused a fermentation in the soil around, that was beneficial, even in the produce at harvest. In the case of the Berkshire beans, something is certainly to be attributed to the hoeing being more effective than in common rows.

BEANS AFTER CLOVER, &c.

To put in beans after clover and other *seeds*, is most excellent husbandry, and preferable to sowing wheat, which does better after beans, and also enables the farmer to get two profitable crops instead of one, with the land preserved at the same time in good heart, and clean.

1. Fallow, turnip, cabbage, winter tares, or potatoes;
2. Barley;
3. Clover, &c.;
4. Beans;
5. Wheat.

Here is a much more profitable course than that of four years ending with wheat; or of five years, by taking barley or oats after the wheat.

The clover lay should be dunged before wheat sowing, if the time should be too dry for that operation, or after it, and then ploughed into such stitches as suit the drill-plough or scarifiers, and planted in this month without more ploughing. This is an excellent system, that cannot be too much commended. The layer affords a good opportunity for carting the manure, which is wanting in some courses.

BEANS AFTER WHEAT.

There are some rich soils, upon which the most profitable husbandry that can be practised is, to take beans and wheat alternately; others on which the same husbandry may be repeated twice in five years, or thrice in seven. There may be one or more such fields on a farm; but wherever found, this management should not be neglected. In all cases the land ought to be ploughed in autumn; no spring ploughing to be given; and the stitches drilled or dibbled this month, if the weather be favourable; if not in March.

BEANS AFTER TURNIPS.

From the wetness of the soil or season, turnip-land, after sheep-feeding, will sometimes be found in very bad order for barley. The general practice is, to persist in the intention for barley, and to effect a partial pulverization, by much tillage and much patience: but if land is found in such order, it is much better to give one deep earth, and to dibble in beans. For this grain, it is no objection that the land breaks up a whole and *clung* furrow, as the farmers term it. The beans succeed well, and the horse and hand hoeings, with the effect of the seasons through summer, bring the land into proper order for scarifying for wheat. I have found this husbandry successful, and every one knows how easily a crop of barley is lost in such a case.

BARLEY AFTER TURNIPS.

Towards the end of this month, part of the turnip-land will be ready for being tilled for barley; and, as this is the first time of mentioning the sowing of that grain, it will be necessary to explain a system that has, for a few years past, and since the former editions of this work were published, been making a greatly rapid progress in Suffolk: it is that of putting in barley on turnip-lands, by means of drilling, without any ploughing.

For this purpose, and for many others, the surface of the field is thrown on to lands (*stitches*, as they are called in Suffolk, and *ridges* in some counties) of such breadth, as shall very exactly suit for one stroke or going of the drill-machine, or for two; a *bout*, as it is termed. The shafts of the drill are fixed, like those of a cart for one horse, that quarters. This will be more particularly explained elsewhere, but the horse-hoeing implements, and scarifiers, and scufflers, whatever may be used, must be prepared according to the drill-machine, to fit the stitches exactly. We shall suppose the turnips to have been drilled, or sown, on stitches sixty-six inches wide, which will admit seven rows of barley to be drilled, at nine inches asunder, besides leaving twelve inches for each furrow. These lands being cleared of turnips, either by sheep-feeding, if the soil be dry, or by carting off with double breast carts (the horses and wheels moving only in the furrows), and the soil on the surface being pulverized and opened in some degree by frosts, the question will be, how to prepare it for barley or oats. The husbandry universal in the kingdom, till very lately, was that of ploughing such land once, twice, or thrice, for spring corn; the better farmers thrice, others once, and a few twice. Upon very dry soils, the evil was little more than that of a useless expence, except, probably, a greater dissipation of the volatile particles of the urine of the sheep that had fed on the turnips; but upon all other soils more stiff

and

and unmanageable, the surface which had been rendered friable by the frosts, being turned down, and the more stiff and *clung* bottom not influenced in the same manner by those natural agents being brought up; that might also, if very favourable weather ensued, be brought into good order, but if the season proved the least unfavourable, the farmer could have no chance of obtaining so fine and safe a tilth as the surface was capable of, without any such reversal of it by ploughing. The new system is, to apply the scarifiers instead of such ploughing. Mr. Cook's with his cast-iron beam, or any other heavy enough, is used, the horses walking only in the furrows, and consequently without any trampling of the land. These scarifiers are of different breadths, but all narrow, usually about three inches, or, at most four, and they will go as deeply as may be thought proper. They ought to stir to the depth to which it would have been ploughed, whether four, five, or six inches. They completely loosen the soil, let down the air, to dry it at bottom, give a very good tilth, with the material advantage of not burying that pulverized surface which frosts have given, and which, if once lost, may not be regained in time for barley. In some cases, one scarifying, and two or three harrowings, will effect the preparation; in others two. Three operations may be wanted in others, that is, two scarifyings and one scuffling, with broader triangular shares. These variations will depend entirely on the degree in which the soil is tenacious, and to ascertain which, the farmer's eye and foot can alone enable him to judge. These operations go off very quickly, and leave the lands, or stitches, in excellent order for the drill-machine to follow, and deposit the barley-seed; the farmer, during the whole of these operations, being as little liable to be thrown out by unfavourable weather, as it is possible he should be, and much less so than if he had ploughed the land. Those who are used to attend to the effects of tillage on different soils, know well, that loams and clays of various degrees of tenacity, if they have been properly formed into lands for winter, and not poached by horses trampling, receive the frosts to advantage, and are found with a friable surface in the spring. If rain comes, it dries, and leaves the surface still in good order, and ready for any operation: but plough such land, and turn up the more adhesive bottom, not acted upon by frost, and let rain fall on such fresh turned furrows; it remains stiff and saddened; it does not become porous again; the air cannot get into it; and if drying sharp winds at north-east follow, the furrows become longitudinal slices of clod, very difficult to be acted upon by any instrument, and the farmer finds himself in a most unpleasant situation. He no more recovers a fine friable surface, and it becomes twenty to one whether he has a good crop. His only chance is, to have abundance of patience to wait for favourable weather, and lay his account to sow very late. The motive for advising him to avoid such spring ploughings, is not derived from the practice of a few individuals, but from that of a considerable district, occupied by numerous and intelligent farmers.

BROAD-CAST BARLEY.

The preceding directions are not confined to the drill-husbandry, but are applicable to the preparation of the land for broad-casting. In this method, the same attention must be given to the breadth of the lands, because the operations must be effected by horses that walk only in the furrows; and when the seed is covered by harrowing, the same attention must be paid to that circumstance.

BARLEY ON FALLOW.

In some very well-cultivated districts of heavy land, it is the common practice to sow barley on a summer fallow; it is particularly so in Essex. There the farmers plough their fallows in August or September, on two bout ridges, of three feet breadth; if in August, some will reverse the ridges immediately after wheat-sowing, others before it. They water-grip the field well, and in February plough and sow, still on the same ridge, but harrowed nearly flat, by harrows made for the purpose. If they have a dry season to plough and sow, they get good crops, but much ever depends on this in spring tillage. To lay their lands in such form as to admit the scarifier and drill, the horses walking only in the furrows, and avoiding any spring ploughing (now the common practice on the strong lands in Suffolk, where they also fallow for barley), is a very superior practice, and attended with great success.

SOW CABBAGE-SEED.

The seed of cabbage intended to be planted in June, may now be sown upon land which has been pared and burnt in August (see the Calendar of that month), and carefully manured and dug in October; but it must be well raked before sowing. Before the farmer determines on this matter, he is to consider another mode of cultivation, which is upon the whole preferable, and will preclude his trusting principally to the transplanting method. This is, drilling the seed where the plants are to remain, and for which April is the proper time, under which month it will be particularly described. Transplanting cabbages demands a very wet time of at least two or three days; and, if hands are not to be procured plentifully, of a longer duration; such a time may not occur when wanted: it must then be waited for, perhaps while the plants are drawing themselves up to long shanks in the seed-bed, and thereby much damaged. This is a great objection to the method, and often causes a light crop on land which, from soil or preparation, is equal to giving the largest. This inconvenience is prevented by drilling the seed where the plants are to remain. It will be the safer way to practise both methods, and it is consequently necessary to describe both in this work. Three ounces of seed should be sown on each square perch of the prepared nursery, well raked in, and then a peck of soot sown over each rod. A cabbage-nursery cannot be too rich, nor too much care taken to have fine strong plants, by afterwards thinning carefully. If this crop is meant to be cultivated on a large scale, an acre of land should be well inclosed for a nursery, kept highly manured, and the seed drilled at nine inches, for the purpose of weeding and hoeing.

SORT OF CABBAGE.

The great American cabbage, which thirty years ago was to be had, and which came to 50, 60, and even 80lb. weight, is, I fear, lost at present. The great cattle cabbage, the great Scotch, the Drumhead, the Dutch, and other sorts, are not distinct varieties, and little dependence is to be placed on the manner in which orders to seedsmen are executed. A farmer should, at first, get the best stock he can, and then trust only to the seed he raises himself. At present, I am inclined to believe that the best sort to be procured, is the large red cabbage. It comes to a good size, and is hardier than most others; green boor cole, brown cole, rape, chou de vache, &c. may now be also sown for transplantation.

REYNOLD'S CABBAGE-TURNIP.

The latter end of the month is the proper time, if the weather be open, for sowing the seed of this plant, if it be intended for transplantation. There are some objections to it, on comparison with the ruta baga, particularly its being still harder, and growing more with fangs, whereby it is more difficult to get it up clean, but its impenetrability by frost will always render it a valuable article, and more so still, if complaints should continue to be heard of the latter plant degenerating here, and rotting with frosts. The preparation of the nursery should be the same as for the preceding articles.

PARE AND BURN GRASS-LAND.

This husbandry is mentioned in the present month, merely that if the north-east winds should happen to set in the last week of it, the farmer may not lose the opportunity. Those are the most evaporating and drying winds of the year, so that this operation never goes on better; and it is to be borne in mind, that the land should be ready pared, to receive their influence when they blow. In the Calendar for March, when this work should be in full operation, I shall examine the question in relation to the expediency of this husbandry, and endeavour to shew, that there is no other way of breaking up old grass, and all waste lands, heaths, commons, downs, moors, fens, mountains, &c. that is comparable to it. I have pared and burnt layers of my own sowing, which were only ten years old, that did well, and yielded plenty of ashes; and this husbandry is so very valuable, that it is no inconsiderable motive for sowing seeds to last nine or ten years, expressly with a view to it.

BLACK OATS.

This month is the proper season for sowing black oats. The land should have been ploughed in autumn, and the seed now harrowed in. Four or five bushels per acre is a proper portion of seed, in rich soils; but six do better on poorer ones. They suit best on turf land ploughed up before the winter*, but left till this time for dibbling in, which is a profitable husbandry. The farmers too often sow them after other crops of corn, but that practice is always to be condemned. They likewise plough for them at the time of sowing. On the contrary, I suppose the land to have been ploughed in the preceding autumn. They follow beans or pease properly, or any ameliorating crop of roots, &c. Supposing the land too wet for dibbling, they cannot be sown this month; but, if the soil and the season will allow, there should be no delay in getting them into the ground; for early sowing of all hardy crops, when the land is dry enough, is of great importance, and many times more than sufficient to balance other very expensive circumstances.

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* The reader will have the goodness to remark, that the direction to plough the land, at a former season, previous to sowing, was given (however imperfectly) in the first edition of this work, printed in 1771.

SORT OF OATS.

The sorts of oats which chiefly demand attention are,

1. *Poland*, which produce, on dry warm lands, a very large plump and beautiful grain.

2. Essex *short smalls*. This is remarkably short, and weighs better than most other kinds. It does on any land that is tolerably dry.

3. *Black*. These are well known; they bear a wet harvest well, and do on the wettest soils.

4. *Church's oat*, yield well; are white, and come into ear more early than any other oat.

5. *Potatoe oat*, lately introduced; is very heavy, and yields largely.

PEASE.

This is also the season for sowing the hardy sorts of pease. The land should have been ploughed in autumn. A farmer, desirous of keeping his land always in good and clean order, should, in the arrangement of his crops, take great care not to be too free with wheat, barley, and oats, which are all exhausting plants. He should sow beans and pease enough, because they are ameliorating ones, and admit hand-hoeing, to kill the weeds. In those fields in which the common husbandmen sow oats or barley after wheat, or after each other, let the good cultivator substitute pease or beans, or some other ameliorating crop, which will pay him better than white corn, under such circumstances, and at the same time keep his land clean. Pease may be sown, like black oats, on turf ploughed up before winter, and now dibbled or scarified in.

I must in general remark, on the culture of pease, that bad farmers are too apt to sow this pulse, when the land will yield nothing else. They have a proverb among them, which signifies, that the season does as much for pease as good husbandry; and they from thence take care that good crops shall be owing to season alone. Hence arises the general idea of pease being the most uncertain crop of all others. This is owing to their being too often sown on land that is not in good order. Let the careful husbandman lay it down as a maxim, that he should sow no crop on land that is not in good order; not merely in respect of fine tilth at the time of sowing, but also of the soil's being in good heart, and clear of weeds. I would not, however, here be understood to rank all these crops together; because beans and pease will admit of cleaning while they grow. On that account, if a farmer comes to a field which his predecessor has filled with weeds, a horse-hoed crop of beans will be expedient, when a barley crop would be utterly improper, and, after land has yielded one crop of barley, certainly another should not be sown, but one of pulse substituted. If these ideas are well executed, the pease and beans, in every course, will find the land in heart enough for barley, the soil will always be clean, and the crop good. Pease, when managed in a spirited manner, will not have the reputation of being so very uncertain a crop, which character has in some measure been owing to ill conduct.

PEASE ON LAYERS.

The white boiling pea, of many sorts and under various names, is more tender than the greys, and various kinds of hog pease; but I have many times put them into the ground in February, and though very smart frosts followed, they received no injury. I have uniformly found, that the earlier they were sown the better. There is also a particular motive for being as early as possible; which is, to get them off in time for turnips. This is most profitable husbandry, and should not be neglected. If they are sown in this month, and a right sort chosen, they will be off the land in June, so that turnips may follow, at the common time of sowing that crop. All the sorts of early pease should be cultivated on dry soils only. They will grow on moist, and even wet ones, but the crop is seldom beneficial. Upon sands, dry sandy loams, gravels and chalks, they succeed well. They are not, however, to be much recommended on land in tilth. Great success is rarely commanded, especially in a wet season, if they be not on a layer.

The following courses do well for them:

1. Turnips,
2. Barley,
3. Clover,
4. Pease and turnips,
5. Barley,
6. Carrots,
7. Barley
8. Clover,
9. Wheat.

Also,

1. Turnips,
2. Barley,
3. Seeds for 2, 3, 4, or more years;
4. Pease and turnips,
5. Barley,
6. Beans,
7. Wheat.

Broad-cast pease are to be utterly rejected in every case. The only question that can arise in their culture, is between drilling and dibbling. If the former is determined on, the land should have been ploughed late in autumn, with Ducket's skim-coulter, into lands adapted to the drill machine and scarifiers. The surface being then worked shallow, in this month drilling should directly follow. If dibbling is determined on, the land should not be ploughed till the time of planting, and a heavy roller follow the plough. On lighter soils, if the frost has worked the surface after ploughing, the ground will be in too friable a state, the holes will moulder in, and the seed will be laid too shallow. Dibbling pease on a layer cannot be too much commended. It is an excellent practice.

There is a remarkable circumstance observed by that excellent husbandman, Mr. Overman, of Norfolk, relative to pease, which should be in the mind of every farmer fond of a pea crop. It is, that they do not succeed well, if sown oftener than once in 10 or 11 years; and I have heard it more generally observed by others, that pease should not be sown *too often.*

SHOULD PEASE BE MANURED?

It is the practice of some farmers to manure for pease: I must confess that I have been always so much against it, that I never did it myself, and therefore can only state my reasons for avoiding it. If the land is in heart, and they are put in on a layer, they do not want manure. A very good crop may be gained without it. I have had five, and even five quarters and a half an acre, without any manure applied for this crop. Dung makes them run to long straw, and that is not favourable for podding productively. Dung encourages weeds; and pease, except in the early stage of their growth, do not admit of such hoeing as a farmer would wish to give. Beans cannot have too much dung, but with pease the case is different. There are very few situations in which the farmer can have such a command of manure as to give him a sufficiency. It is therefore of much consequence to him, never to spread a load but where it will be sure to answer best. Every man complains of a want of dung; how very careful therefore ought all to be, to give it to the crops that will pay best for the expence.

ROWS OF PEASE.

The practice of various farmers differs exceedingly on this point. Equi-distant rows from nine to 18 inches are common. I have seen them at two feet, and even at three. In dibbling, it is common in Norfolk and Suffolk, to put in two rows on every flag of nine or ten inches breadth; some farmers one row on such a furrow: and I have known very good crops in most of these distances. If horse-hoeing, or much hand-hoeing, is intended, double rows at nine inches, with intervals of 18, do well; but the greatest crops I have known, have been from planting every flag.

QUANTITY OF SEED PEASE.

From two to two bushels and a half per acre is the usual quantity, in planting every flag. If they are drilled at greater distances, six or seven pecks will do. Some have trusted to one bushel per acre, but that quantity is too small.

BORDERS.

This is a proper season for bringing the borders of the enclosures into good order. They are generally found to be high, irregular ridges of land, from earth thrown out of ditches, and not carted away, and from the turning of the ploughs and harrows. They are often over-run with bushes and wood, and much land is thereby lost. The best method to be used with them, is first to cut all the wood, and make it into faggots, and then to grub up the roots, and make them into stacks, for which work labourers are generally paid by the piece. It is proper to agree with them for raising the earth into a high ridge in the middle of the border. In most countries, this will be done for 6s. to 10s. a stack, of the roots 10 feet long, three high, and three broad; but in others it may cost more. The earth then lies ready, and without any obstruction, for carting away, either to the field, to the farm-yard to make a compost, or for dung to be brought to it. But, in case one spit deep is not sufficient to make the border lower than the surface of the field, which it should always be, or, at the least, on a level with it, if it is grass land, it will be advisable to let the men who stub up the roots, leave it level, and set others to dig it to the proper depth. I have seen many farms so over-run with rubbish, that the borders occupy a considerable part of the whole. They then yield a very contemptible profit; for the product by wood that is spontaneously planted, and open to all cattle, (consisting three parts in four of brambles and rubbish) is of little value; upon the whole, no object, compared with the land lost. When cleared, and dug away to a proper depth, they are ready to be laid down for grass, so as to pay rent as well as the rest of the farm. In arable fields, the plough will advance much nearer the hedges than before, and yet leave space enough for a grass border. Such an object as this may appear trifling to some farmers, who have not attended to the great loss of land from this slovenly practice, but to good husbandmen, desirous of making the most of every part of their farms, it will not appear in such a light.

WOODS.

This month, as well as the preceding, is a good season for felling underwood, in which work, and the converting of the product to the best profit, lies much judgment. When a farmer has taken a farm that has a wood in it, he should consider well which is the most advantageous use to put it to. In some countries hoop stuff pays best; in some, hop poles are, of all other articles, the most profitable; in others, faggot-wood of various sorts. In some situations, bushes, loose or tied in faggots, are particularly valuable. In others, nothing in a wood pays so well as hurdles. Whatever answers best, the farmer should apply his wood to, and subject his management of it to such changes as a variation in demand may occasion. This may appear superfluous advice to old farmers, but there are many young ones that want reminding now and then of such circumstances.

CARROTS.

This crop is of vast importance to the farmers who have spirit enough to cultivate it. It is common husbandry in some parts of this kingdom. The soil proper for carrots being dry gravels, sands, or loams, it may probably be practicable to plough them this month. This tillage will not be necessary, if the land bids fair to work fine in March. Let me here remark further, that in case the land is very mellow, and in order good enough for being harrowed on this month's tillage, it should by no means be omitted to sow upon this ploughing, and harrow in the seed; for although March is the common season, yet the uncertainties of weather are such, that the state of the land, in most cases, requires a greater attention than the name of the month; and carrot seed, though the weather be severe, will take no harm. It may be sown without danger in November. In case March turns out very wet, and your sowing is driven into April, it is twenty to one that the crop will suffer.

The preceding is the method pursued by some persons, and with success; but I must observe, that the Suffolk system is quite different; and as the crop in that county abounds far more than in any other of the kingdom, there being, perhaps, more carrots in it than in all the rest of England together, much attention is necessarily to be paid to their ideas and practice; and that is universally, to sow nearly about the 25th of March, and not to plough till then.

CABBAGES.

The fields designed for cabbages in April or May, and ploughed in October on to the ridge, should this month, if the weather will admit, receive an earth, reversing the ridges, but not stirring flat. This will have good effects in pulverizing the soil, which it may be supposed to want, as it consists only of stubbles turned up in autumn. This is a point that should be attended to; for cabbages are always to be considered as a fallow, in which

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light their importance must appear sufficiently great. As this tillage is the first that marks the land for the crop (all stubbles being ploughed in autumn, for whatever crops designed), it will be proper here to speak more particularly of the preparation and design of the culture.

Cabbages flourish to very great profit on all good soils, and have the particular property of enabling the farmers of clays and wet loams to winter more cattle than those of lighter lands can effect, by means of that excellent root, the turnip. The great evil of clay farms used to be, the want of green winter food, which confined their stocks to hay alone, and consequently prevented their reaping those extended articles of profit, that arise from numerous herds of cattle: and besides the immediate benefit from the cattle, they lost also the opportunity of raising large quantities of dung, which never can be effected so well as by keeping cattle. But all these evils are by the cabbage culture remedied, and the clay farmers put in possession, in many respects, of an equality with the turnip ones. If the difference between a summer-fallow year on clay, and a turnip-fallow on light land, be considered, the importance of this discovery will appear sufficiently clear. Thirty shillings an acre expence, of the first, are not an exaggerated calculation; but all is saved on the turnip land, perhaps with profit; and the barley, that follows the turnips, is probably nearly as good as that which succeeds the summer-fallow clay. Supposing the following clover and wheat equal in both, according to soil, still there remains a superiority in the article of manure; for all that is raised by the consumption of the turnip crop is so much superiority to the dry soil. But reverse the medal. Suppose cabbages to be introduced on the clay, and the scene is changed. That crop will exceed the turnips, yield more profit, and enable the farmer to make more manure. For these reasons, the recommendation of cabbages appears to be extremely well-founded; and consequently, those farmers who possess the proper soils, cannot determine too soon to enter on the cultivation of them.

But there is another circumstance attending some sorts of cabbages, which make them highly eligible on all farms, which is their lasting for sheep-feed longer in the spring. Ruta baga, turnip cabbage, cabbage turnip, and green boorcole, are in perfection in April, and last even to May, the most pinching period in the year. Turnips will do no such thing; consequently those farmers who possess turnip soils, should, on no account, slight the culture of cabbages for this purpose.

WATER-FURROWING.

Care must be taken to cut water-furrows through all new ploughed lands, as soon as the fields are finished. Saving a trifle of money in the omission of such a necessary work, often hazards a crop, and is sure greatly to damage it. In making them, the descents and variations of the surface are to be kept in view, so that no water can lodge in any part, however wet the weather. The old water-furrows in the wheat-fields are also to be examined, as well as those in the fallows ploughed in autumn. If they have been filled at any place, by the crumbling in of the moulds after frosts, or by the passage of moles, or other accidents, they must be cleaned out. Too much attention cannot be given to keep the lands quite free from stagnant water.

MANURE GRASS-LANDS.

This is the proper season for laying on several sorts of manure, such as soot, coal-ashes, wood-ashes, lime, malt-dust, &c. and in general those that are spread in too small quantities to require a whole winter's rains to wash them in. The use of these manures, and other light dressings in February, is very beneficial; but, throughout the management of purchased manures, experiments should be formed for a year or two, before the practice is extended, to see which, at a given price, will suit the land best. Without this precaution, a farmer may probably expend large sums of money to little purpose. Nor would I advise him to trust to the mere appearance of the effect soon after the manuring; for some of them, particularly soot and malt-dust, will shew themselves after the first heavy showers, in a finer green than the rest of the field; but the proof of the effect does not arise from fine greens, but from weight of hay; for I have myself found from experience, that the latter is not always an attendant on the former. Contiguous half-acres, or roods, should be marked out, the prices of the manures calculated, and on each piece a separate one spread, all, for instance, to the amount of 20s. an acre. At hay time, the crops should be weighed. It will then be known which manure, at the given prices, suits the soil best. This knowledge will prove true experience, and a very different guide from general ideas.

MANURE GREEN WHEATS.

This is likewise the season for spreading superficial dressings on the green wheats, such as soot, ashes, malt-dust, pigeons' dung, poultry dung, rabbits' dung, &c. and many other sorts in the neighbourhood of great cities. It is very good husbandry; but the profit depends on the expences. I shall venture to recommend trying them in small, (a rood, for instance, to each) before extending the practice to whole fields. As to dungs, provided the prices be not extravagant, there can be no doubt of malt-dust and soot answering on all soils. Whenever a farmer has the choice of manures, never let him hesitate about which to take. He may lay it down as a maxim, that all animal manures are excellent. Others may be the same, but they are not so universally beneficial to all soils.

FARM-YARD.

Throughout this month, great attention must be paid to the farm-yard, and all the buildings where cattle are, to see that every place be kept constantly littered, so that the beasts may be clean; and, if the stock of litter laid in in autumn will not last, it is time now to agree with some neighbours, for a weekly supply of refuse straw or stubble. At all events, there ought never to be a want of litter, either in the stalls or the yard; for the only way of raising large quantities of dung, at a cheap rate, is to make use of plenty of litter.

PLANT WILLOWS.

I do not, in this Calendar, mean to treat of the planting of trees, as that is the business rather of landlords and gentlemen, than of farmers; but with the quick-growing aquatics the case is different. If any part of the fences of the farm are situated in low, wet, or boggy places, it is a chance if thorns prosper well. The best method of repairing them is to plant trunchions of willow, sallow, alder, &c. for hedge-stakes, and along the bank, for plashing down afterwards, which will ensure the tenant a great plenty of firing; and in such situations, and in waste spots that cannot easily be better improved, it will answer extremely well to set longer trunchions for pollard trees. They repay the expence with great profit.

PLANT OSIERS.

It is now a proper time to plant osiers and other sorts of willows. No part of the farmer's business pays better than such plantations, and especially if he has any low, spungy, boggy bottoms near a stream. The land should be formed by spade-work into beds six, eight, or ten feet broad, by narrow ditches; and if there is a power of keeping water in these cuts at pleasure by a sluice, it is in some seasons very advantageous to do so. The late Mr. Forby, of Norfolk, knew the value of these plantations well, for various purposes. Osiers planted in small spots, and along some of his hedges, supplied him with hurdle-stuff enough to make many dozens every year, so that he supplied himself entirely with that article, as well as with a profusion of all sorts of baskets, especially one kind that he used for moving cabbage-plants, for which purpose they were much better than tumbling the plants loose in a cart. The common osier he cut for this purpose at three years, and that with yellow bark at four.

TARES.

This is a proper season for sowing spring tares, called in some places, vetches, fetches, thetches, &c. The land I suppose stirred in autumn. The first season in this month that is dry enough, should be chosen for harrowing in three bushels an acre of seed. I suppose them designed for making hay or feeding green; but, if they are for a crop of seed, two bushels will be sufficient. Tares for hay make a most excellent fallow year. They are mown before they draw or exhaust the land at all, and their extreme luxuriancy and thick shade so mellow and loosen the soil, and kill all weeds, that, if the crop is good, and the seed sown not later than February, there will be a very good chance for a crop of turnips after them, on one earth; but, without such luck, this husbandry is far preferable to sowing two crops of corn running. If a farmer thinks of sowing barley after wheat, barley, or oats, or oats after either, let him throw a crop of tares for hay between two of corn, and he will be sure to reap the benefit of it. They will give him, on middling land, from a ton and a half to two tons and a half of hay per acre, which, with their cleaning and ameliorating nature, will be found to far exceed any second crop of corn on the same land.

WATERED MEADOWS.

Much attention is now required in the floater. Mr. Wright remarks, that if the water be suffered to flow over the meadow for the space of many days without intermission, a white scum is generated, which is found very destructive to the grass; and if the water be then taken off, and the land exposed in its wet state to a severe frosty night, a great part of the tender grass will be cut off. In Gloucestershire, two methods of avoiding these injuries are practised. One is, to take the water off by day, to prevent the scum, and to turn it on again at night, to guard against the frost: the other method is, to take the water off early in the morning, and if that day be dry, to suffer it to remain off for a few days and nights; for if the land experiences only one drying day, the frost at night will do little injury. The former of these practices, where it is found not too troublesome, is preferable to the latter. About the middle of this month, the floater begins to use the water rather more sparingly than in autumn or winter, for his chief object now is, to encourage or force vegetation.

In the last week of this month, if the preceding management has been good, there will be a good bite for ewes and lambs.

Mr. Boswell prescribes rolling after Candlemas.

POTATOES.

This root is one of the most profitable crops the farmer can cultivate; nor does the advantage of it depend on markets for selling them; for they will pay a beneficial price, if given to cattle of various sorts, or hogs. In Ireland they feed their cows on them with profit. The land designed for potatoes, I suppose to have been ploughed in autumn. They are to be planted next month, or in April; and, as they affect a good tilth, it will be advisable to plough the land this month, preparatory to the planting earth, provided the weather be dry enough: but in the preparation for this, as well as for all other crops, no ploughing should go on while the soil is at all wet.

As this tillage marks the land designed for this crop, it is proper to caution those farmers who are unacquainted with the culture of it, against applying too much land to it. If they have a great plenty of dung at command, they may enter largely into this husbandry; but they should determine to plant no more land than can be manured at the rate of 25 or 30 large loads per acre; for one acre well cultivated, will pay better than five, or even ten, indifferently managed.

PARSNIPS.

Of all the roots which a farmer can cultivate, this is the most valuable; but it demands a better soil than any other crop he can put into the ground. If he has not land of an extraordinary quality, he had better not venture on the culture. They love a very deep, rich, dry, sound, friable, sandy loam, ploughed as deeply as possible towards the end of autumn, and left for the frost to pulverize and sweeten. About the 12th of this month, if the weather be favourable, it will be proper to sow and harrow in five pounds of seed per acre, which will come up in about six weeks. In order that the young farmer may see what inducement there is to apply so good a soil to this use, I shall here lay before him a short detail of advantages, given by a considerable farmer in Surrey, which was communicated to the Society of Arts.

"I will now proceed to relate the use I made of this root. In the first place, I put up 16 hogs a fattening upon them. The method I took in giving them to the hogs, was throwing the parsnips on the ground whole. This I continued for about a month, when finding my hogs grow heavy, I observed they did not go on so well with them as at first. Upon this I boiled the parsnips, and made wash of them: thickening the wash with half a bushel of barley-meal every day. I gave it them in a trough, and continued this method for two months, when I killed them, and found them to be very good meat; weighing from 28 to 33 stone per hog. One of them, being very large, weighed 58 stone. The neat value of my hogs, when killed, amounted to 52l. 17s. 4d. The whole expence of of my barley-meal with which I thickened the wash, amounted to 3l. 18s. 9d.; of the firing to boil them, at 6d. per day, 1l. 10s.; of a boy to look after them for three months, at 6d. per day, 2l. 5s. which sums, added to the expences attending the parsnips, prime cost of the hogs, &c. amount in the whole to 35l. so that my profit upon this article only, is 17l. 16s. 8d. which remains to be carried to the account of the parsnips. After my hogs were killed I kept four dairy cows upon the remainder of the parsnips for three months, which, at 1s. 6d. per week, amounted to 3l. 12s.; and this sum, added to the 17l. 16s. 8d. before mentioned, makes the neat profit on the one acre of parsnips to be 24l. 8s. 7d.

"I must observe, that giving my dairy cows the parsnips, answered my purpose greatly, by increasing their milk, and making the butter much richer and finer than turnips or carrots, which I had given them long before. The manner in which I gave the parsnips was, cutting them in pieces.

"Finding the parsnips agree with my hogs and cows so well last year, I now determined to give them to my horses; and having five that were making up for sale, I began with them by giving them a very few the first week. I observed then that they agreed with them extremely well, and I therefore gave them a larger quantity, which made them thrive very fast, and determined me to continue giving them the parsnips, which saved me a great deal of hay, as I found they had occasion for very little of it. I kept them in this manner for ten weeks, when I sent them to Mr. Bever's repository, where they were sold for 40 guineas each horse. The manner in which I gave them the parsnips was, cutting them in small pieces and throwing them into the manger. I calculate the return half a guinea per week for the parsnips for each horse, which amounts to 26l. 5s. to be carried to the account of the parsnips for this year.

"At the same time I began fattening an ox, which cost me 4l. 10s. from the plough. He was 13 weeks in fattening, and ate nothing but parsnips the whole time. I then sold him to Job Spratley, a butcher at Guildford, for 2s. 8d. per stone, weighing 102 stone 6lb. which amounted to 13l. 14s. 4d.

Exclusive of the above, he had within him 22 stone 6lb. of loose fat, which was more than ever was known to be taken out of a bullock of that weight in the town of Guildford, and it was remarked by many, that finer beef never was eaten. I mention these particulars, in order to shew the great use of parsnips, as I am convinced by experience, they are preferable to carrots or turnips. But to proceed on in my account: the profit upon this bullock amounted to 9l. 4s. 4d. which I also carry to the account of the parsnips.

"The remainder of my parsnips I gave to seven dairy cows eleven weeks, at 1s. 6d. per week each, which amounts to 5l. 15s. 6d. so that the neat profit (after deducting 6l. 12s. per acre for the necessary expences attending the parnips, as per the calculation for last year) amounts to 28l. 10d. besides a great many of the parsnips that I gave occasionally to my store-hogs and cattle, which I valued at 3l. 10s."—*Budd.*

CROP TREES.

Cropping pollard-trees should be finished this month. Top-wood is usually for the tenant's firing, and it demands a landlord's attention to see that they do not, when ditching, convert young timber-trees into pollards, which certainly was the origin of all we see.

LAMBING.

The flock will probably begin to lamb in this month, and there is no business on a farm that demands more care, attention and assiduity. As soon as the farmer looks for the ewes beginning to lamb, they ought every night to be folded in the standing littered fold, on one side of which there should be a small cottage-hut, built to be warm, with a chimmey, and stove for heating milk, and a bed for the shepherd to lie down upon. Here he is to sleep through the lambing season, that he may be ready to watch, assist, and tend, any ewes that he sees very near lambing, and if necessary, to give the lamb some warm cow's milk. Some of the considerable Norfolk farmers have these huts on four wheels, to draw about with the flock, wherever they may be; but to have one littered and well-sheltered standing-fold, on a moderate farm, and two or three conveniently placed on a large one, to take the flock to, without any distant driving, is far preferable to that method.

SHEEP IN ROUEN.

Upon enclosed farms, where the reverse of rouen may be supposed to be much greater than is generally possible on flock-farms, the sheep, as they drop their lambs, should be drawn from the flock of ewes, and put to this food, upon which an entire reliance may be had: and let it be remembered, that all turnips should be consumed this month, which circumstance will prove the vast importance of reserved grass as a succedaneum.

COMPOSTS.

"The farmer may use composts to advantage, when they consist of proper materials, and are skilfully mixed. Where a variety of materials can be had, they may be laid as follows: first, clay or strong earth; next, soap-ashes, dung, loamy-earth, lime, tanners-bark, green vegetables before they run to seed, earth, soap-ashes, dung, tanners-bark again, earth, or as many of these as can be got: also fat-chalk, sea-weeds, sea-sand, and several others; which may be so mixed, as not only to raise a general fermentation throughout the whole compost, but likewise to suit the nature of the land on which it is intended to be laid. The common way is to lay the several materials in layers, one over the other, till a large heap is raised; and it is advised by some authors, and the practice of many farmers is, to make these layers from six inches to a foot in thickness; but this I have found by experience is wrong. For the fermentation raised in the compost is not strong enough to penetrate these thick layers, especially those of clay, or strong earth; for after the rest have sufficiently fermented, and the compost is turned, these layers rise almost as whole as when first laid, and must be broken by hand, to mix them with the rest of the compost; whence arise two inconveniences; one, an extraordinary expence of labour; and the other, that twice or thrice turning is sometimes necessary to dissolve these large pieces; and as a new fermentation is excited every time the compost is turned, the strength of the manure is greatly wasted before it is laid upon the land, where it is then incapable of raising any considerable fermentation, which is one of the principal uses of manure.

"The best way, therefore, of making compost, is not in thick layers; but after the ground is marked out for the compost, to lay the several materials, after being well broken, in heaps round the space marked out for the compost-heap; and to place a man between each two heaps, to throw the manure spreading upon that space. In this manner the compost-heap will soon be raised to the intended height, and the several sorts of manure being thus well mixed, the whole will soon begin to ferment, and will incorporate as fully in two months, as the same manures, placed in layers in the usual way, will in four or five. The owner, therefore, in making such compost, should not prepare them too long before they are laid upon the land; otherwise they will be much wasted, and their best parts evaporated.

"Composts prepared in this manner need not be turned, or at most not above once. If the fermentation is observed to abate too soon, make holes with a pole, from the top almost to the bottom of the heap, upon which throw urine, or the running of a dunghill, which will fill the holes, force through the whole substance of the compost, and soon complete the fermentation.

"Such a compost, by duly proportioning the ingredients, may be made to suit any sort of land, and is good for meadow or pasture grounds. A way to improve these, is to cut them five or six inches deep with the five-coultered cutting-plough, or scarificator, which cuts the surface in slips four or five inches asunder, but does not raise or turn them. This cutting of the roots of the grass, and the manure laid on at the same time, sinking into these incisions, made by the coulters, causes an improvement in the quality of the herbage, and also makes such grass-grounds produce more than they did before. But here it is to be noted, that cutting the ground first, and then laying on the manure, makes a greater improvement than manuring first and then cutting; and both are superior to manuring and not cutting. The cutting-plough is used with success upon temperate clay-grounds and loams; but in very strong grounds the coulters are apt to be thrown out of their work by stones; and therefore it is not proper to use the cutting-plough where stones abound.

"In such composts where it is intended to use a large proportion of earth, that lies at a considerable distance from the homestead, to save the double carriage of it to and from the compost heap, the dung and other materials may be carried to a headland of the field to be manured, and there mixed into a compost.

"The best situation for a compost, is upon level ground; or if made upon a descent, a trench should be cut on the lower side to receive the running of the heap, which is some of the best part of it, and should from time to time be thrown up again, which will quicken the fermentation.

" The richest composts may be made in the farm-yard, which should be made gently deepening all round, from the sides to the middle, in form of a shallow bason. When the yard is made in this form, little of the urine or liquid part of the manure can run off or be wasted. When the dung is carried from the stables, cow-houses, &c. into the farm-yard, it should not be thrown carelessly in heaps, each sort by itself, but carried in carts or wheel-barrows, and laid regularly, and spread all over the yard. Upon this should be spread a thin layer of earth, mud, the scourings of ditches and ponds, green vegetables before they run to seed, and such other materials as are most suitable to the nature of the land to be manured with them. The racks and cribs out of which the cattle are foddered, should be frequently moved over the yard, that the offal straw and hay may be equally dispersed, and trod in by the cattle. This method of spreading the dung and other materials being continued, the whole will be incorporated with the urine of the cattle, and make an extraordinary rich compost.

" The only inconveniency of this kind of compost, is its being filled with the seeds of weeds, from the earth mixed with it, the hay, straw, and dung of the cattle. It is therefore a manure best suited to grass-grounds, and to such arable lands as are to be hoed, as turnips, cabbages, carrots, potatoes, beans, &c. as these weeds will in great measure be destroyed by good hoeing."

So many farmers are fond of composts, that I have ventured this one quotation in their favour, which contains as much as can be said for them. In my own opinion, nearly the whole business of composts is founded in error, and that thus to apply any sort of dung or sea-weed, is sure to be done to a loss; and vegetable substances should be thrown into a hog-yard for making dung.

LIME.

The lime-kiln may be kept burning through all this month, and lime carted and spread whenever the carts can move without damage to wet soils. This may be done on dry land at all times.

MARLING,

May go on profitably through all this month. In January, I gave an account of the methods of one who had marled more than most men; and here I shall note some opinions of another excellent farmer, who occupied 1200 acres, and marled much of it.

" From different trials of my own, at a very great expence, and the observations I have made on my neighbours' and the Norfolk farmers' manner of improving light sandy lands, by clay and marl, I am clearly convinced, that about seventy square yards* is the properest quantity to be laid upon an acre of land, pole measure. If more be laid on, the longer it will be before it incorporate with the soil, and of course, the longer before any benefit can be received from it. I once saw an instance, where a farmer laid on 120 loads, or square yards per acre, and gave this reason for it, that the land was so poor, he was sure he could not hurt it. But the consequence of it was, that after an expence that would have purchased the fee-simple of the land, I could not see, for many years, that he had done it any good, as it produced no better (if so good) crops, as lands by the side of it that had not been clayed at all, but otherwise farmed the same. It has now, however, evidently the advantage of the other lands, having been done above twenty years.

" This trial was in the middle of a shiftable field, where, by the course of husbandry, two crops are taken to one summer tilth; and, where this is the case, claying, &c. seldom (or never I might say) answers the expence; for claying and marling being only a first, or beginning of improvement†, by going on directly with a course of ploughing, which cannot well be avoided in shiftable fields, it is often buried and lost before it mix properly with the soil, especially if turned in too deep the first earth, of which great care should be taken. I would

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[*] A square yard is as much as is generally carried for a load.

[†] An excellent observation. The whole paper is full of truly practical knowledge. *A. Y.*

would therefore recommend claying or marling only upon enclosed lands, unless where large breadths lie together, that can be farmed in any manner the occupier pleases; and in that case (as well as in enclosures), I would advise that the lands should be laid down with clover, rye-grass, and trefoil, the spring twelvemonth before laying on the clay or marl, and to remain at least six months after it, that it may have time to sink and eat itself into the flag before it is ploughed up, and then there will be little or no danger in losing it, as it will already be in some measure incorporated with the soil.

"No pains should be spared to break all the lumps, and get it fine by repeated harrowings and rollings, and having all the stones picked and carried away, that the grass may get through as soon as possible, for stock to be grazing upon it, which is the great and finishing improvement; for, as I observed above, claying or marling seldom or never answers where you go on immediately with a course of ploughing in the John-Trott way.

"In my opinion, as much, or more, depends on the management of lands after claying or marling, than in the mere laying it on, which, however, is very expensive, and therefore a very persuasive argument in favour of that sort of management that will be the most likely to make it lasting.

"Little need be said about the different qualities of clay or marl, as every one must be content to use such as is found on his own premises, for I never heard of any in the counties of Suffolk or

Norfolk, that would answer long carriage*: clay that is freest from sand and marl, that is soft and greasy, is certainly the most valuable; and even blue clay, that is condemned by most farmers, I have found to answer very well on light sands, but they generally lie at too great a distance from each other to be prudently got together.

"Where there are different sorts of manure equally convenient upon the same premises, which is sometimes the case, viz. pure clay, white soapy clay marl, clay with much marl in it, loamy clay and cork; I should certainly prefer the former for light sandy lands; on sands of a stronger nature, that have a mixture of loam with them, I should choose the soapy marl, or that mixed with clay marl, whichever was most convenient; but any of the inferior ones must be used, rather than submit to long carriage, especially on a large scale.

"In point of the expences, the first is the *filling*, which, including spreading, is 25s. a hundred, or 2½d. a load, with an allowance by some farmers of 2s. 6d. by others of 5s. for opening the pit, and 1s. a load for all the large stones they throw out at the time of filling; the farmer to find drifts and stakes, for letting down what they call the *falls*.

"The team must consist of four strong trace-horses, and two shaft-horses, which, for such strong work, must have very high keeping. I cannot therefore lay their labour at less than 2s. a day each*, and the carter at 1s. 6d. a day, which, supposing they carry, one day with another (allowing for wet weather and hindrance by accidents, &c.), 30 loads a day, will be about 5¼d. per load more, making in the whole 7¾d. a load for filling, carting, and spreading.

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* In the county of Kent I have seen a sort of marl that the Essex farmers buy, which, after being sent many miles by water, I am informed, they find answers carrying five or six miles by land.

"As farmers differ in opinion about the quantity that should be laid upon an acre, some preferring 80 loads, and others 70, I will take the medium, and say,

Seventy-five loads, which, at 7¾d. a load, is per acre,	£.2	8	5¼
Harrowing and rolling several times, to pulverize and spread it equally on the surface, per acre, ...	0	1	6
Wear and tear of carts and harness, including accidents, at a farthing per load per acre, ...	0	1	6¾
Loss of seed, as it should always be laid upon a layer, and be some months before it is ploughed in, per acre, ...	0	1	0
	£.2	12	5½

SAINFOIN.

"The sowing of sainfoin seed ought never to be deferred longer than the beginning of March, but it is still better to complete this work in February, as there is generally at that time a degree of moisture in the ground sufficient to accelerate the vegetation of the plants; whereas, if the seed were sown at a later period, and a dry spring should take place, great part of it would never vegetate, and that which did grow, would be liable to be destroyed in its infantine state by the fly."—*Bannister.*

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* Two shillings a day for a cart and horse may be thought a high price, but when it is considered that he is, or ought to be, worth 20l. I believe no person in his senses would lend another such a horse, pay keeping, shoeing, and farrier, and run the hazard of his being spoiled by being whipped and strained 30 times a day out of a clay-pit, for less money.

MARCH.

BARLEY.

THIS is the proper month for getting seed-barley into the ground. Crops later sown may be very beneficial, but, if all circumstances were equal, the March-sown would be superior to any at a later season, which is here the comparative point of consequence. This grain is sown after various preparations. Turnips are the most common, which root will not last for feeding any cattle, with propriety, upon the average of seasons, longer than the beginning of this month: so that the turnip-land barley must be sown on one earth, or the season be absolutely lost; for April and May sowings are inferior. I am not here asserting, that April is a month improper for sowing barley; I know the contrary from experience; but if soil, ploughings, manuring, water-furrowing, &c. are equal, a March-sowing will exceed an April one, on an average of several years, by four bushels in the crop. Saying, therefore, that barley, in certain places, is sown in April and May, and yields great crops, is saying little, unless it be added at the same time, what parallel success other crops had sown in March. Neither do I venture to insinuate, that all March-sown crops will be successful. One great point in putting in most crops, but barley particularly, is to have the land dry. March may pass away without a single ploughing season for wet lands in the whole month. In such a case barley cannot be sown; but still this is not in reference to a particular practice, but to a general maxim in husbandry. Ploughs ought never to work if the land be wet; consequently, advice to sow barley in March must always be under the proviso that the land is dry enough for ploughing.

Summer-land barley, on clay, or other heavy soils, should be sown on one earth, in the first dry ploughing season, whether in February or March. In some clay countries, the farmers have a particular system of barley culture. They summer-fallow their land, and lay it up on three feet ridges, well water-furrowed for the winter. In a hard frost they carry on their dung, and leave it in heaps till sowing time, when they spread before the ploughs. This is good husbandry. It is conducted upon the same principle upon beans, pease, tare, potatoe, or carrot land: all which crops are taken up in autumn, and the land ploughed after them, on to the ridge, and well water-furrowed, ready for spring-sowing. The great point is, to have the soil, previous to the crop, in such good order, that no other spring tillage than the seed earth may be necessary.

The most profitable way of cultivating barley, is to throw it into a regular course, preparatory to the clover. For instance:

1. Turnips,
2. Barley,
3. Clover,
4. Wheat.

Or, 1. Cabbages,
2. Barley,
3. Clover,
4. Wheat.

Another:
1. Fallow,
2. Barley,
3. Clover,
4. Wheat.

Whatever variations may arise in the crops, still barley must always follow either an ameliorating crop or a fallow, and in many cases be followed by clover. In several parts of the kingdom, unacquainted with clover, this latter reasoning may appear bad; but that can only arise from false ideas of the use of clover. Let good grass lands be ever so plentiful, they will in no case be found to preclude the use of clover.

Thus far the culture of barley has been treated, for the use of those farmers who adhere to the common management of spring-ploughing. It is necessary always to keep in mind, that the system mentioned last month, of avoiding spring-ploughings, is applicable to many cases.

BARLEY AFTER TURNIPS.

If the turnips were not drawn and carted, or not eaten by sheep, in time enough to allow sowing with barley in February; or if the farmer does not approve of sowing this grain early, by reason of the quality of his soil; in these cases, March may be the principal period of his barley-sowing. As the fields are cleared, much attention should be given to the state and temper of the surface; for turnips are ventured on so many soils that are not entirely fit for them, that difficulties often occur at the time when it is proper to stir for the spring-corn that is to succeed. The season is now so far advanced, that it may be unsafe to trust to such smart frosts ensuing, as shall have any effect in pulverizing the soil. Upon all clays, and loams of any degree of tenacity, which have been sheep-fed lately, the surface may be firm and trodden. The degree will depend upon the weather that has taken place, whether wet or dry; but if the farmer has a strong and heavy hoe in his hand, or a spade, he will easily perceive whether or not the temper of the surface will let the scarifier work effectually. In this respect, more attention is necessary now than in February, as the advanced state of the season has lessened his chance of frosts, which are more effective in giving friability than any other circumstance. If this tool works well, or is likely to work well, by the 20th, its use should preclude the plough; but if, from the state of the surface, compared with that of the soil, at the depth of five inches, it appears that a ploughing is really necessary, in such case, the prudent farmer will, of course, give it. His grand object, in this examination, is to avoid turning down a surface which is in a friable state, and bringing up another, which will harden, by north-east winds, into *clods of brick*, as they are sometimes called. Let him only have the circumstance in contemplation, and he will then be guarded, on one hand, against being wedded to customary tillage, and, on the other, against being too ready to trust to new methods, of which he may have had little or no experience. It must, however, at all events, be prudent to make a trial in every field, as the result will bring more conviction than any previous reasonings. Such trials may be made, whether he sows his barley broad-cast or drilled. He should keep in recollection, that if the last earth for the turnips turned down a manuring, it is better situated for safety against sun and wind, than if brought to the surface by a new ploughing; that it lies where the barley-roots will find it; and that the urine of the sheep sunk in the soil, is less liable to evaporation without than with ploughing.

BARLEY AFTER FALLOW.

If the weather, in February, prevented sowing the fallows with this grain, there can be no question in what manner to execute it now. *Here* ploughing should certainly be rejected. These fallows have had the frosts of the whole winter, and must necessarily be fit for scarifying or scuffling. It is the same with all land ploughed before winter; such as tare, bean, and pea-stubbles; and also with turnip-lands that were cleared and ploughed early. In all such cases, the use of these implements may safely be adopted.

DRILLING BARLEY.

Quere. Whether the importance of this practice does not increase as the season advances? Barley put into the ground in February, has the start of many seed-weeds, which might vegetate as quickly as the crop, in the latter part of March, or in April. In the former case, broad-cast crops might be clean in fields, which, if sown in the two latter months, might be much more subject to the depredation of weeds; if so, the drill will, in this respect, be of great use. It is a dreadful spectacle which some districts exhibit, of crops, yellow from the quantity of charlock. To free drilled corn from such enemies, is much easier than to weed broad-cast crops.

SEED BARLEY.

Increase the quantity of seed-barley as the season advances. Early-sown crops have more time to tiller than late-sown ones. If three bushels be the quantity in February, three and a half should be sown the end of March.

"The season of sowing has been recommended by the Northern Botanic School, to be drawn from the foliation of vegetables; for which idea, the following table will be of use.

"As I do not know that any thing of this kind has ever been published in England, I will subjoin the order of the leafing of some trees and shrubs, as observed by me (Mr. Stillingfleet) in Norfolk, anno 1755.'

1. Honey-

1.	Honey-suckle,	January	15
2.	Gooseberry,	March	11
3.	Currant,		11
4.	Elder,		11
5.	Birch,	April	1
6.	Weeping-willow,		1
7.	Rasberry,		3
8.	Bramble,		3
9.	Brier,		4
10.	Plumb,		6
11.	Apricot,		6
12.	Peach,		6
13.	Filbert,		7
14.	Sallow,		7
15.	Alder,		7
16.	Sycamore,		9
17.	Elm,		10
18.	Quince,		10
19.	Marsh Elder,		10
20.	Wych Elm,		12
21.	Quicken-tree,		13
22.	Hornbeam,		13
23.	Apple-tree,		14
24.	Abele,		16
25.	Chesnut,		16
26.	Willow,		17
27.	Oak,		18
28.	Lime,		18
29.	Maple,		19
30.	Walnut,		21
31.	Plane,		21

32. Black Poplar,	April 21
33. Beech,	21
34. Acacia Robinia,	21
35. Ash,	22
36. Carolina Poplar,	22

"It is wonderful to observe the conformity between vegetation and the arrival of certain birds of passage. I will give one instance, as marked down in a diary kept by me in Norfolk, in the year 1755. April the 16th, young figs appear; the 17th of the same month the cuckoo sings. Now the word κοκκυξ signifies a cuckoo, and likewise the young fig; and the reason given for it is, that in Greece they appeared together. I will just add, that the same year I first found the cuckoo-flower to blow the 19th of April.

"To the instance of coincidence of the appearance of the cuckoo, and the fruit of the fig-tree in Greece and England, I will here add some coincidences of the like nature in Sweden and England.

"Linnæus says, that the wood-anemone blows from the arrival of the swallow: in my diary for the year 1755, I find the swallow appeared April the 6th, and the wood anemone was in blow the 10th of the same month. He says, that the marsh-marigold blows when the cukoo sings: according to my diary, the marsh-marigold was in blow April the 7th, and the same day the cuckoo sung."

OATS.

White oats should be sown now, in preference to any other season; and, in the general conduct of them, the farmer should, by all means, avoid the common error of sowing them after other corn crops, by which they exhaust the land. They should always receive the same preparation as barley; nor ought a good husbandman to think of their not paying him as well for such attention as that crop. It is a very mistaken idea, to suppose it more profitable to sow barley on land in good order than oats. I am, from divers experiments, inclined to think, that oats will equal, and in many cases exceed barley. The superior quantity of the produce will ever be found to more than answer the inferiority of the price; which, however, sometimes exceeds that of barley.

What good reasons are to be offered, for sowing oats on land in such bad order that barley is not to be ventured in, I know not. The common argument is their hardiness, which will give a middling produce, about sufficient to pay expences, and leave a trifling profit, when no other crop will do the like. But this is only proving them to be assistants of bad husbandry; nor is such a paltry profit, granting false premises (for I am well persuaded that common oat crops, among bad farmers, are but so much loss), an object that ever ought to influence good husbandmen. Why should a good farmer be at all solicitous to gain 10s. an acre profit by oats after barley, &c.? Suppose his course to be, 1. Turnips; 2. Barley; 3. Oats: or, 1. Fallow; 2. Wheat; 3. Oats: in either of these courses, or in any other, where the oats follow another crop of corn, the profit of them must be small. What comparison with sowing clover with the barley, which will pay far more profit, and at the same time prepare, in the best manner, for that most beneficial crop, wheat? What but a fallow, or a fallow crop, can succeed the oats? How unprofitable, compared to the clover system!

For these reasons, I cannot but recommend that oats should be considered in the same light as barley, and never sown unless the land be in proper order for barley, or to sow them after a fallow crop, and clover with them, in the same manner as barley.

The question between barley and oats depends, first, on the relative price. Oats may be expected to yield from one to two quarters per acre more than barley; it is therefore easy for the farmer to calculate at given prices which grain will pay him best: but it is not to be forgotten, that barley leaves the soil in much better heart than oats leave it, as they take much more from it than barley, being a more exhausting crop.

OATS AFTER TURNIPS, &c.

The observations which have been made on barley, are equally applicable if oats be sown. And the farmer should, in the distribution of his farm, consider which of these two crops is likely to pay him best. This will very much depend on his soil. Warm forward sands yield as many quarters of barley, perhaps, as of oats; but upon various other soils, the produce of oats, compared with that of barley, will be as four to three, and on some as five to three. He should also take into consideration, the greater steadiness of price which oats have for many years yielded, in comparison of the price of barley; circumstances which may reasonably induce him to sow them in a larger proportion than is common among his neighbours. On the other hand, it is not to be forgotten that they exhaust more, as I have just observed.

OATS ON LAYS.

It is very common husbandry to put in oats on one ploughing of old grass, and on layers of shorter duration. The method is, to plough the land before the frosts, and to dibble in the spring, as soon as the weather is dry enough; but the soil must, from its nature, or from rolling, be in such temper as to permit the holes *to stand*, and not to *moulder* in, when the dibble is removed. In some cases, the safe way is, to plough, roll, and dibble immediately. But in very many cases (possibly in all), it is better to put pease in on light land, beans on stiff soils, and to follow these with oats or wheat, according to circumstances. I have known oats, which had produced inferior crops, followed by oats again the next year, and produce largely, which proved that they wanted *tilth*. Pease or beans will rather improve than exhaust land, when put in thus on layers; whereas, two crops of oats will scourge the land too much.

Let it, however, be well remembered, that these observations are made (so far as they relate to old grass), on the supposition that the farmer will not, or is not allowed, to pare and burn, a method vastly superior, and which ought to be pursued in all cases where it is practicable.

CLOVER.

There are several methods of sowing this seed, which is so profitable upon almost every farm, that it must be had if possible.

1st, In the drill-husbandry, it may be sown broad-cast and harrowed in, at the time the barley is drilled; a pair of light harrows at the same time following the drill-machine, to cover the clover-seed.

2dly, It is sown before the roller, when the barley is four inches high.

3dly, It is hand or horse-hoed in, when the corn receives either of those operations, if the farmer is in the practice of giving them.

These are the methods most commonly used. Mr. Ducket drilled the seed in the same drills as the barley, but that way is very uncommon.

Another way I have known, has been that of scarifying the barley-stubble in harvest on light soils, and sowing the seed alone then.

Of these methods, the first is the surest for a crop, and the most to be recommended, notwithstanding the admitted evil which sometimes takes place in a wet season, of the clover growing so luxuriantly as to damage the barley. The second succeeds well, if rain follows in due time, and would, perhaps, generally succeed, if the farmer ventured to harrow it in, which he might safely do. In the third method it often succeeds, but it also often fails, nor is it necessary, in many cases, to hoe the barley.

In regard to the quantity of clover which the farmer sows, he has several considerations to govern his determination. In the first place, it is in many situations, and on many farms, as profitable a crop as any other he commonly reaps. On tolerably good land, he may expect, at two mowings, three tons of hay; on good, three and a half, and even four. Or, if he applies it to soiling his teams, for want of lucern, the produce in a different way is equally striking. This produce is also gained at a very cheap rate; cheaper than he gets any other crop. Add to this, that it forms an excellent preparation for either beans or wheat. Still, however, the quantity to be sown will depend, in some measure, on his having lucern, sainfoin, or a great plenty of meadow land. If he is deficient in these, it becomes more than useful, it is essential.

The unfortunate circumstance which attends clover, is its being extremely apt to fail, in districts where it has been long a common article of cultivation. The land, to use the farmer's term, becomes *sick* of it. After harvest he has a fine plant, but by March or April, half, or perhaps more of it, is dead. This makes a new course of crops necessary. Instead of its occurring once in four years, as in the common Norfolk course, it becomes necessary to sow it only in the second round alternately, beans after barley in one course, and then clover in the next. This has been found to answer. The observation, however, should be made not without remarking, that on a farm at Morden, in Surrey, Mr. Arbuthnot, by means of deeper ploughing than common, and ample manuring, succeeded well with clover every third year in this course:

1. Beans,
2. Wheat,
3. Clover,

on land that was said to be sick of it, though sown before only once in four years. I viewed his crops in that new course during three rounds, and never saw finer.

Ten to twelve pounds an acre is the usual quantity of seed, but fifteen are better.

TREFOIL.

Upon light and poor sandy lands, on which clover does not succeed well, it is common husbandry to sow trefoil, with a portion of white clover and ray-grass, with intention of leaving it two years. Six pound of trefoil, four of white clover, and half a bushel of ray, are common quantities. These are for sheep-feed.

WHITE CLOVER.

A very profitable article of cultivation, which has of late years been particularly attended to in Suffolk and in Essex, is that of white clover alone for seed. The first growth (contrary to the case with red clover) is seeded. Some take a spring feeding first. The returns depend, of course, on the price, which varies much, but it has proved a very profitable article, yielding from 7l. to 15l. an acre. Wheat succeeds well after it.

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GRASSES FOR ALTERNATE HUSBANDRY.

Upon impoverished worn-out lands, and others ill-treated by bad management, and over-cropping with white corn, there is no better system than that of the alternate husbandry of corn, and grass for sheep-feeding. Such lands are much recruited by these means, and will, after a term of years surprize their occupier by the superior corn-crops, which five or six, or even four years' sheep-feeding will enable them to give. They should, however, be got into clean order. The course:

1. Turnips,
2. Barley,
3. Grasses for four, five, or six years,
4. Beans or pease,
5. Wheat,

will in one round improve them much. The object for present consideration is the seeds to be sown. The following may be recommended:

Cocksfoot, Yorkshire white,
Timothy, White clover,

and a small quantity of trefoil. If sown alone, the quantities are: cocksfoot, four bushels; York-white, two bushels; Timothy, 6lb.; white clover, 10lb.; trefoil, 10lb. but a mixture may be better. In a Prize Essay sent to the Board of Agriculture, the following remark deserves attention:

This is not an uncommon system in Rutlandshire, and is a very profitable one. By loams lying in grass, and being well-covered with sheep, they are prepared in the best manner for corn, and it is the same on fen and peat lands. The following is a proper course:

On soils inclinable to moisture, or of good fertility.	On drier land.
1. Oats,	1. White pease and turnips,
2. Turnips,	2. Barley,
3. Barley,	3. Clover,
4. Clover, or winter tares,	4. Wheat,
5. Wheat,	5. Turnips,
6. Turnips,	6. Barley,
7. Barley,	7. Grass for three years.
8. Grass for three, four, or five years.	

Such husbandry must keep land in a constant state of fertility.

This alternate husbandry appears to be well understood in Northumberland. "By means of three years grasses depastured with sheep, the land will grow good crops of oats, which they could never get it to do under their old system. Soil, sandy, and dry light loams."—*Report*, p. 64. "Various systems have been tried in Northumberland, particularly the boasted course of, 1. Turnips; 2. Barley; 3. Clover; 4. Wheat; till the crops have evidently declined, particularly the turnips and clover; and the only means of restoring such lands, have been the system of three years arable, and three years grass *depastured by sheep*. By this mode, Nature has time to prepare a sufficient lea-clod, which, being turned up for the turnip-fallow, will ensure a vigorous crop of turnips, as it is well known that they always flourish upon fresh land, or where they find the remains of a lea-clod to vegetate in. The portion that is kept in grass for three years, breeds and fattens such a number of sheep, as leave a considerable profit, probably equal, if not more than the arable crops, the yearly profit of a sheep being estimated at not less than 20s. to 30s. six or eight of which, an acre of clover will fatten, and an acre of turnips about double the number." This is to the credit of the Northumberland drill system, or the soil must be very extraordinary. "By this system are obtained the principal advantages of folding, without any of its inconveniences; for if, on an average,

The 1st year's clover and grass carry	7 sheep an acre,	for 20 weeks,
2d	5	20
3d	3	20
and the turnips	12	20
that is	27 sheep per acre,	for 20 weeks,

which is after the rate of 540 sheep per acre for one week, once in six years, leaving 25s. a head profit."—*Ib.* p. 163.

The great advantage of having land alternately under grass and corn, was known in the last century. *Considerations concerning Common Fields and Enclosures*, 4to. time of the Commonwealth, page 10. But in France, much earlier, De Serres, 1629, page 6.

SAINFOIN.

This is the principal season for sowing sainfoin, and if the reader has land that will produce it, he can apply it to no crop equally profitable. Loams and sands upon chalk are the favourite soils; also loams and clays in a shallow stratum, on limestone. It does, however, on very dry sound gravels, but not if the under stratum be much mixed with clay. I have tried it without success on good dry turnip loams, but on every species of chalk and white marl its success is certain. The profit far exceeds that of any other application of such a soil. On poor sands in Norfolk and Suffolk, worth only 5s. an acre, the crop, for several years (after the first), has been from one to two tons and a half per acre, of excellent hay, and mown every year. Whatever the price of hay may be, such a produce on such land is prodigious, with the additional circumstance of an aftergrass extremely valuable for weaning and keeping lambs. I know not a more lamentable circumstance than to see such poor soils yielding a beggarly product in corn, other grass and turnips, with not one acre of sainfoin where there ought to be an hundred.

Sainfoin, on extremely favourable soils, will get the better of weeds, but it is always right to sow it with barley after turnips; four bushels an acre broad-cast, but three are enough drilled. If with drilled barley, the best way is to drill the corn first, and then the sainfoin across the former drills.

PEASE.

This month is the proper season for sowing all sorts of pease, that were not sown in February; nor is it proper to delay any of them later, if the weather now suits. White pease should be sown last, and on light land; for they do not succeed well on heavy or wet clays. There are scarcely any soils that do not suit some pea or other. Stiff clays do very well for the hardier hog-pease, and all lighter loams, gravels, chalks, and sands, answer well for the tenderer kinds. In common management they are sometimes ploughed, and at other times harrowed in; which variation often makes a difference in the crop; for, if the land is apt to bind with rain, and the pease are ploughed in, they sometimes do not rise at all, not having strength to pierce the plastered surface. But this evil attends the very binding soils only with late sowing. On the contrary, when the seed is only harrowed in, if the field is not very well watched, the pigeons and birds will carry away much of it, and for that some allowance should be made. If land breaks well with the harrow, it is best to harrow in on all but the very lightest lands. But on loose sands, or very light and porous soils, or those that are extremely dry, it must certainly be preferable to plough in, on account of having a greater depth, and of being further from the sun, which is apt, in hot summers, to burn these soils.

Pease should be sown after corn. They always come in best after wheat, barley, or oats, generally with good husbandry after layers. I can hardly suppose a situation, where this is not the right management: they come very properly into such courses as these:

1. Turnips,
2. Barley,
3. Clover,
4. Pease,
5. Wheat:

Or,
1. Cabbages,
2. Oats,
3. Clover,
4. Pease,
5. Wheat.

When wheat succeeds clover, you may throw in a crop of pease after it, if it suits you better than to come again to turnips, cabbages, or beans, the first of the course.

"If wet weather happens whilst the pease lie in wads, it occasions a considerable loss, many of them being shed in the field, and of those that remain, a great part will be so considerably injured, as to render the sample of little value. This inability in pease to resist a wet harvest, together with the great uncertainty throughout their growth, and the frequent inadequate return in proportion to the length of haulm; has discouraged many farmers from sowing so large a breadth of this pulse as of other grain; though on light lands which are in tolerable heart, the profit, in a good year, is far from inconsiderable. The straw (as hath been mentioned before) is a very wholesome food for cattle of every kind; and there is generally a considerable demand for pease of every denomination in the market, the uses to which they may be applied being so many and so various. The boilers, or yellow pease, always go off briskly; and the hog-pease usually sell for 6d. or 1s. per quarter more than beans. For feeding swine, the pea is much better adapted than the bean, it having been demonstrated by experience, that hogs do fat more kindly when fed with this grain than on beans; and, what is not easy to be accounted for, the flesh of swine which have been fed on pease, it is said, will swell in boiling, and be well-tasted; whilst the flesh of the bean-fed hog will shrink in the pot, the fat will boil out, and the meat be less delicate in flavour. It has, therefore, now become a practice with those farmers who are curious in their pork, to feed their hogs on pease and barley-meal, and if they have no pease of their own growth, they rather choose to be at the expence of buying them, than suffer their hogs to eat beans. Nay, so far do some of them carry their prejudice in this particular, as to reject the grey pease for this use, as bearing too near an affinity to the bean,

and

and therefore reserve their growths of white pease solely for hog fatting.

" Pease, if the ground is kindly for their growth, and the summer moist, do generally produce a great abundance of haulm, which takes up a large space in the barn, and for this reason, the mow ought always to be trodden with hogs or horses, which will close down the haulm into one sixth part of the compass it would otherwise have occupied."—*Bannister.*

DRILLED PEASE.

This pulse, in many districts, is drilled, which is a very good method. The great use of drilling pease is, the rendering it so much easier to hand-hoe them. Good farmers, whatever their soil, are always desirous of getting the hand-hoe into as many crops as possible, and few pay better for it than pease; but, when promiscuously sown, it is difficult and expensive to perform that work well; whereas, if they are drilled in equally-distant rows, one foot asunder, the hoeing is regular work: it will be executed much easier, better, and cheaper, and the crop be consequently superior: for that operation, given while the plants are quite young, checks the weeds so much, at the same time that the crop is forwarded, that the tendrils join the sooner, and are much the stronger for it. Consequently, a thick, luxuriant crop is gained in a much greater degree. Another advantage in this method is, the saving of seed: for a bushel, or a bushel and a half less seed, will do in this way than in broad-cast sowing.

PEASE ON LAYERS.

There is scarcely an article of cultivation to be treated of in a Calendar at present, in which a double attention is not necessary, and which may give an appearance of repetitions that are unnecessary. But when it is considered that there are clearly two descriptions of farmers who ought to find the use of such a work, being both inexperienced, such an idea will be found erroneous. There are men who design only to pursue the practice of their own district, in which great improvements may not be common; and there are others more enlightened, who wish in every month to be reminded of what are the works going on at that time in all other districts, that they may try them or not, at their pleasure. The preceding articles, under the head of pease, are for the former description; but the latter were probably at work for this crop in February, for by means of that new and great improvement of autumnal ploughing, for so many crops to be put into the ground in the spring, without any fresh ploughing, the land may have been laid in stitches, exactly suitable to the drill-machine, and to the scarifier, scuffler, and harrow, so that the surface may now be worked to the necessary degree, without a horse ever setting his foot any where but in a furrow, and consequently not treading the beds or stitches in the smallest degree. With this management, all spring works are much accelerated. However, February certainly may, in some seasons, pass without the farmer being able to put in his crop of pease. In that case, the work must be done in March, by the directions given in February, whether for drilling or dibbling.

BEANS.

February is the month in which the farmer should be active in putting in this crop. Some delay it for the more tender sorts, but I have remarked in many trials, that even these have succeeded better when sown in February. Should the weather prevent early work, of necessity it must be postponed, and then, as with pease, the directions must be postponed in execution for one month.

BEANS TO BE EATEN GREEN.

Some experiments were made by a very ingenious gentleman, in sowing beans for stall-feeding bullocks, while podded but yet green. It was not in my power to ascertain how it answered, but attention to this scheme has been since recalled, by another similar trial, for the use of hogs, by Mr. Cross, and which has been published by Dr. Hunter. The circumstances merit attention. He drilled garden beans at three feet, and afterwards turnips in the intervals. When the beans began to lose their flowers, and to shew a disposition to pod, they were drawn by hand, and given to 38 pigs, ten weeks old, well littered with straw. These were bought the 18th of May, and were kept on clover till the beans were ready. The beans being consumed, the pigs were sold the 18th of September for 40l. beyond the prime cost, and they made 40 loads of rich manure. They consumed four acres of beans. To persons who make it a point of using hogs as the means of raising large quantities of manure (and there is no more effective way of doing it), these hints may be very valuable. Beans used for this purpose may be off the land very early, probably much earlier than these were, and in time for putting in another crop immediately, either late turnips or cole-seed, and the land cannot be in the least exhausted. With this view, there should be a succession of plantings in February, March, and April.

BEANS BETTER THAN OATS ON LAYS.

" To sow oats on a lay newly broken up, especially if such ground has been many years in grass, is at all times very hazardous, and frequently causes a total destruction of the crop, an instance of which I experienced in the spring of the year 1771. The preceding winter had been very severe, with a continuation of unkindly weather till late in the spring, for at the close of the month of April the ponds were covered with ice, and sharp frosty nights intervened till the 10th of May. Early in the month of March I sowed with oats a sainfoin lay that had been ploughed up some months before, and covered in the seed with the large two-horse harrow, and as soon as possible closed the soil with a five-horse roll, so that the ground seemed to lie as close as one could desire; but the dry frosty weather above-mentioned setting in for a month afterwards, rendered the surface very poroos, and the soil was become dry as ashes, and by far too light for the purposes of vegetation. Towards the middle of April, the oats, by favour of some kindly showers, began to make their appearance, but before they were all fairly out of the ground, the worm seized on the fibrous roots below the surface. The land being at that time not sufficiently dry to admit the use of a roll, I endeavoured to close the lightened soil by treading it with horses. My primary view was, to have trodden the upper part of the field only, the lower side remaining at that time unhurt by the worm; but in a few days these insects spread over the whole close, and although I omitted no opportunity of treading and rolling throughout the spring, the crop at harvest was very slender, as well in straw as grain. From hence we may learn, how hazardous it is to sow such lay ground in the first year after breaking up, with oats, or indeed of cropping it with any other grain than either beans or pease; for though, in a very kindly year, such corn may not be totally destroyed by the worm, as it turned out in the event, with the greatest part of my oats; yet there is no doubt but (maugre all his care and pains) the husbandman will then find cause to repent of his conduct, and should a dry frosty time succeed, the destruction of the crop is inevitable. Still more hazardous is it to sow this grain on what is termed a lay-breech, as the worm will in such a season be more likely to destroy the crop, than even after the first breaking up of the lay-ground."—*Bannister.*

TARES.

If the weather in February did not allow sowing spring tares, or at least all the crop, the work must not be delayed longer than March, otherwise the crop will suffer. The best way is to plough the land flat, or on broad lands, and harrow in the seed: but the farmer must observe well, that the soil be dry before his ploughs go on it, which is an universal rule, that ought never to be deviated from.

TARES ON A STALE FURROW.

Sowing on a stale furrow is much superior to a fresh ploughing. If the land was ploughed before the Christmas frosts, and the weather in February has been favourable to the vegetation of weeds, some may have appeared, but the scarifiers or scuffles will utterly destroy them, and working only in the dry pulverized surface, will prepare for the seed much better than ploughing. Let it be remembered, that the necessity of a succession of tare crops (which may be continued through all the spring) depends on the farmer's being not duly provided with lucern, chicory, clover, or other crops applicable to soiling. If he has such crops, tares are proportionably unnecessary; but if he has not, then he should be very careful to have a due succession of tares. These are also to be applied to penning sheep, and are for that use of much importance.

CARROTS.

This is the season for sowing carrots. The land should be deep ploughed, flat, and 5lb. of seed to an acre sown broad-cast, and harrowed in. If the weather is unusually wet, a farmer may be prevented from getting on the land; but, if possible, he should delay it no longer than the 25th. The proper soil should not be mistaken through common notions, nor confined to a compass much within its reality. It is a general idea, that nothing but sands will do for carrots; but this is a mistske. The best soil for them is a sandy loam, rather light but moist, of a great depth; in which there is little difficulty in ploughing to the very beam of the plough, all the soil brought up being of the same kind, and as fit for vegetation as the surface. This sandy loam, with these properties, should in general yield good crops of all sorts. But, at the same time that I mention this soil as most desirable, still the crop will thrive to great profit on heavier loams, but not on wet ones or on clays. On good wheat loams, of the gravelly kinds, that plough easily, they do well. At first sight, such soils might perhaps be thought too stiff; but they will yield large carrots; the expences, however, are higher in cleaning, &c.

I cannot leave this article without recommending to all the possessors of the lighter sort of lands that have a pretty good depth, to cultivate this excellent root with spirit; not to confine it to a little close of an acre or two, but to introduce it, in the course of the crops on a farm, regularly, like wheat, barley, turnips, or any other plant. None will pay better; and, if managed tolerably, few so well.

The almost uniform practice in Suffolk, where this root is cultivated more largely than in any other part of the kingdom, is to delay all tillage till the time of sowing, the favourite period for that being about the 25th of this month. The best of all preparations for this root is a turnip-fallow, the crop of which was fed on the land by sheep. The next best a barley stubble, which succeeded turnips so fed. Some farmers put them in on a wheat stubble, when a manuring of yard-dung has been given for the wheat crop; but in this way they are more apt to be foul. A modern improvement, and which deserves attention, is that of steeping the seed from twenty to thirty hours, in order to accelerate its coming up.

Though carrots are *consumed* only in the winter and in the spring, and consequently their use to be treated of under the head of winter and spring food, yet as the young farmer must determine in this month of March, what breadth of land he will apply to carrots, it is necessary to mention here some of the inducements which should instigate him to venture, without apprehension, on so very profitable an article of cultivation.

1st, The teams of horses cannot, in any other way, be fed so profitably as on this root. If they have only chaff and carrots, the allowance is two bushels per horse per diem. If a bushel of oats per horse per week, then one bushel a day of carrots, and no hay. An acre of 400 bushels, lasts one horse 200 days, or two horses 100 days, during which time they are in perfection. Thus fed, it is an acre per horse: or, at half-feeding, half an acre per horse.

2dly, They are excellent for all sorts of stock-hogs, sows, and weaned pigs. They have been found to fatten well, though some who have tried them for that purpose have had ill success. However, for all lean hogs, there is no question or dispute, that they *thrive* well on them.

3dly, No food is superior for fattening oxen.

4thly, Nor for feeding young cattle and milch cows.

5thly, They fatten sheep profitably.

They may be estimated to cost 6l. per acre, or 3½d. per bushel, prime cost. Supposing 4d. it is evident that the advantage must be very great. The common selling price, among neighbours, in Suffolk, is from 6d. to 9d. a bushel: generally 6d.

Nor is it only in the use of them that this crop is valuable to the farmer: they are also very advantageous to the land. In the opinion of some farmers in Suffolk, the barley which succeeds them is equal to that after turnips fed on the land by sheep; and all agree, that they prepare perfectly well for that crop. A circumstance which speaks for them, perhaps more than any other, is, that the culture, within the last ten years, has increased greatly in that county, so that there are now probably twenty acres, where, twenty years ago, there were not five. It is common now to see from twenty to thirty acres on a farm. If a young cultivator, therefore, possesses any dry and deep soil, he cannot do better than determine upon this branch of farming, which will be sure to pay him well.

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CARROTS ON GRASS.

This is not common husbandry any where, but it should be in the farmer's recollection, that they do exceedingly well put in on one ploughing of old grass-land, on a proper soil. Mr. Gainsborough, of Sudbury, on a farm at Braintree, in Essex, ploughed up a grass-field, the turf seven years old, and harrowed in carrot-seed immediately; the soil a good loam, worth 20s. an acre twenty years ago. The crop varied from 600 to 700 bushels an acre. He practised this husbandry three years successively on different portions of grass, and with uniform success*.

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* Annals, vol. v. p. 414.

PARSNIPS.

Early in this month parsnips are to be sown. They are not to be recommended, except on the deepest and richest soils. The land should be dry but very fertile. The putrid rich deep sands worth 40s. or 50s. an acre, the deep friable sandy loams, that are as good two feet deep as on the surface, are the soils fittest for this root. On these they come to a great size; and no other crop on such land can pay better. Where the soil is proper, the inducement to cultivate them is very great, for they will fatten bullocks as well as oil-cake, and are excellent in fattening hogs. Of all common roots they are the most saccharine. The tillage and management is the same as for carrots, but they demand deeper ploughing: four pounds of seed the proper quantity, sown like carrots, broad-cast, and the first week of this month the right time. If the weather is favourable, they may be sown the last week in February, and harrowed in. Both these roots have been tried in drilling, by very skilful drillers, but they have not answered like broad-cast crops. Nothing prepares better for corn, if due attention be paid to keeping them entirely clean.

POTATOES DIBBLED.

The land I suppose to have received its first tillage in autumn; and, if it was inclinable to be rough, to have had a second ploughing in February. The first dry season in this month, it should be stirred again flat, turning in the manure, of whatever kind it may be. The best is farm-yard dung; and the more the better, unless the soil be very rich. Upon an average of soils, less should not be laid than twenty-five or thirty large loads per acre, which should be spread equally, that it may plough in well. As soon as the surface is harrowed smooth, the planting should be begun, which is performed in this manner: A man holds in his hand a dibble, which has one point, and a *bit* for him to set his foot on, to strike it into the earth, in order to make a hole to receive the set. A woman, or boy, follows him with the sets, and drops one into each hole. After this, the land is harrowed twice or thrice, and the business is done. They are in this method set promiscuously, at from nine inches to one foot asunder. The work is done quickly, and is not very expensive. In this promiscuous way, from fifteen to twenty bushels of potatoes are necessary to set an acre.

POTATOES ON GRASS.

Grass land is often broken up for a crop of potatoes, and by most people preferred to any other. The methods are, first, to dung it moderately, fifteen or twenty loads per acre; then to dig up the turf, work in the dung at the same time, and dibble in the sets, in the way before mentioned. The crop scarcely ever fails of being great in this method. Another is called the lazy-bed way. The grass marked into beds five feet wide, with slips between them, two feet wide. The beds are then dunged, about fifteen loads: on the dung are laid the potatoe-slices, after which the turf is dug thinly up in the two feet intervals, and laid on the sets, which, with another spit, and the loose mould, completes the covering. This is not equal to digging all the ground, on account of its being left whole for the succeeding crop, but the produce of potatoes is generally good; for, besides the dung, they have the turf below to spread upon, and are partly covered with that from the trenches, so that they lie hollow, and in a rich bed.

POTATOES ON BORDERS.

If you have any rough borders of fields, that were grubbed up to clear away roots and rubbish the preceding winter, it is common to dig them regularly in the beginning of this month, and dibble in potatoe sets, by which means there is a certainty of getting a beneficial crop; for such places are generally fertile, from the rooting of leaves and wood. They will be left ready in autumn for carrying the earth on to the field, in order to level the border, and lay it down to grass. When some rich earth is thrown out of ditches, or mud out of ponds, it is often left long enough for yielding a potatoe crop, which either is capable of giving.

POTATOES FOR HORSE-HOEING.

The new husbandry has been much recommended for the culture of potatoes, and there have been many instances of great crops gained in this manner. The practice of it is various; but whatever the manner, the land should be ploughed into ridges for them, according to the rows intended. They have been tried in equally-distant single rows, at two, three, four, and five feet. In double rows, at one foot, on four-feet ridges; the same, and also three rows, on five-feet ridges. These methods may have succeeded, but the wide distances between the single rows certainly lose too much land. If equally-distant rows are used, three feet are preferable. Double rows on four feet have succeeded. All give the advantage of the horse-hoeing culture, without losing much room. Equally-distant rows, at two feet, with a neat horse-hoe that turns no furrow, but only cuts the surface of the ground, earthing up afterwards with a double mould-board, have likewise succeeded. The principle of introducing the horse-hoe is to save some of the expence of hand-hoeing, and at the same time to make the crop flourish better. The advocates for this husbandry acknowledge, that there are more plants in the old method; but assert, that the tillage of the plough is so much more effectual than that of the hand-hoe, and the admission of air among the plants so much freer, that the loss of number is more than made up in the gain of size. It has also been said, that horse-hoeing is so effectual, that there is no occasion for dung with it; but let all good farmers be very suspicious of such assertions. If they give up the benefits of rich manurings for any purpose so imaginary, they will certainly repent it. Potatoes may, in certain soils, be cultivated without dung, but not with equal profit; and on most lands it is absolutely requisite. After all, let it be remembered, that April is a better time for planting this crop.

CABBAGES.

There are two principal seasons for planting cabbage-crops designed for cattle, viz. the latter end of April and the beginning of May, and about Midsummer. The land for both I suppose to have been ploughed the first time at Michaelmas. If February was very favourable for tillage, another earth should have been given, if the teams had leisure for it. The fields to be planted in April and May, must be ploughed again in March. These stirrings are not to be flat, but the land kept on the ridge, by reversing. If as much time can be spared this month from seed tillage (which is ever the most important part of tillage), as in April, it will be now advisable to plough those lands also that are for the Midsummer crop, by which means there will be a certainty of gaining a fine tilth, late in spring, which is the best method of destroying seed-weeds.

In the beginning of this month, seed should be sown a second time. The seed, and seed-bed, must be proportioned to the intended quantity of crop. A good rule is, to sow one pound of seed to every three acres of land intended to be cropped.

For a seed-bed, a rich piece of land summer-fallowed, and dunged with rotten stuff, is to be chosen. See the Calendar for last month, for paring and burning for a nursery; also for the sorts of cabbage.

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REYNOLDS' CABBAGE-TURNIP.

This month, if the weather be favourable, is the proper time for sowing the seed of this plant in a seed-bed, for transplantation in June. It is a remarkable circumstance, that very great and successful exertions were made in the culture of this plant thirty years ago, but that it went out of general use, without any sufficient reason; for its great merit was then well known. Long since that period, the ruta baga, or Swedish turnip, was introduced; but in Norfolk the depredations of the fly upon this plant have been so great, that it is also in danger of being given up. As there is no point of greater importance than that of providing green winter and spring food for cattle, I must recommend a due attention to both these plants. The following particulars, by Mr. Reynolds, communicated to the Society of Arts, dated in April, well deserve the attention of the farmer, relative to this cabbage-turnip.

"I have sent six more of the roots for the inspection of the Society, indifferently chosen. They weigh 38lb. so that upon an average, at this time (viz. April 29), there is no less than 35 tons per acre. And let it be observed, they are not full

grown,

grown, the spring being backward, otherwise the product would have been greater. I pitched a fold in the form of an oblong, in two divisions, and placed therein 387 sheep, April 2. The crop has kept them exceeding well, without any fodder, or even any other provision (save only the turning them into a rough pasture a few hours in the middle of the day, for by so doing, they return fresh to the roots in the afternoon); and will maintain them in the same manner till the 12th of May, I am confident, which is in all full 40 days. I placed those designed for fattening in the front, and the store sheep in the rear. The plants are drawn up with a three pronged hoe. The fold is removed daily, for those in front to have fresh food; and those in the rear eat the remains of what was left the day before. Thus the whole is spent without the least loss, and the land enriched at the same time. This I say, by experience gained last year; for my barley crop, on land in the same state, turned out very good; both in quantity and quality inferior to none of my other growth (which was upwards of 80 acres); the product full five quarters per acre, sown the 12th of May.

" Eight milch cows have been fed with these roots for this month past, and are very fond of them; and I have found great savings in my hay since they began them. Both the milk and butter proved very good, and a considerable increase in both kinds.

" I also find that hogs and pigs like them extremely well. Sows give plenty of milk when fed with these roots.

"Upon the whole, it is very certain that they are found to be of the greatest utility.

"Nothing that I can find out, is more beneficial to the landholder, *for spring-food,* especially in hard weather, and times of distress, such as we have of late very severely felt. This consideration *only*, ought to encourage all concerned in raising them, were there no other motive whatsoever. But that is not the case; for I find that besides this great food, *of giving plenty in time of need,* there is another benefit annexed to it, viz. the improving land for the ensuing crop, when these roots are spent with sheep where they grow. These are circumstances of the greatest merit in agriculture, especially to those who have them in possession.

"These roots are proof against frost; whereas turnips have been but of little service in general this spring, the frost having destroyed many of them long ago. But these vegetables are now in a fine flourishing state, quite sound and good; well tasted top and bottom: better food cannot be desired for horned cattle and sheep. It seems, indeed, the very thing long sought for, namely, good spring food.

"This is certain, my sheep are now thriving beyond all expectation; whilst other flocks, in general, having no such provision, are almost starved to death for want of sustenance.

"If what is here asserted and proved by experience,

ence, will not induce people to raise these roots, I know not what will."

In a letter from Mr. Reynolds, dated the 15th January, he speaks thus of the produce of the turnip-rooted cabbage: "This is certain, large crops have been obtained within the two last years in several counties. Their product have risen from 25 to 35 ton per acre; and if my memory serves me right, there are two accounts from Nottingham and York, as high as 44 tons. Kent and Sussex have obtained near 50 tons; but one gentleman in Surrey has outdone all that I have yet heard of. This plantation, and that no small one, produced upwards of 56 tons per acre, in 1770. I have this well attested; and that many of his single roots weighed 14lb. each. This may seem incredible to some, but it is not so to me in the least. For my shepherd brought me one single root, on the 4th of May, 1773, that, when cleansed, weighed 17lb. the most extraordinary plant of this kind ever beheld. My curiosity led me to see where it grew, and, on viewing the place, I found it stood where a heap of grass-burnt ashes had been ill spread; and this occasioned its extraordinary size." Mr. Reynolds' conclusion, with respect to the great magnitude of this root, is justified by many instances of extreme great crops of the brassica, or cabbage kind, being produced on land, after burn-baiting; and even after burning the turf of heathy land, without any other manure.

This account of the great utility of the turnip-rooted cabbage, is strongly confirmed by several passages of Mr. Reynolds' letter of January 15, 1774, mentioned in the preceding note. He says, "With respect to my turnip-rooted cabbage, I find it is now propagated more and more in this neighbourhood, with all desired success; and begins to spread apace throughout every county in England and Wales, and in some parts of Scotland. It has been cultivated by an eminent North Briton, as he expresses it, *to their very good liking and advantage, and withal, is much admired in bearing frost very well;* which, according to his information, is more intense and severe than with us. I have letters to prove they are in no small esteem in the kingdom of Ireland: and I find they are recommended by their Society to all concerned in breeding and feeding cattle." Mr. Reynolds supports his assertion in this letter, of the great utility of this plant as a spring-food for cattle, and more particularly for sheep, by the instance of what happened to him in 1773, "when most of the turnips that had been sown the preceding year had failed; or those few that had escaped run away to seed much earlier than common;" and the farmers therefore were in the utmost distress, at the same time that he, having no less than seven acres of this plant, felt no inconvenience.

TURNIP-FALLOW.

The land designed for turnips, I suppose to have been ploughed from a stubble at Michaelmas. In this month it should receive the second earth, which is very necessary, that it may, by harrowing well, or by another stirring in April, if the land is stubborn, be made so fine, as to ensure a thick crop of weeds in May. A succeeding ploughing turns them in, and quite destroys them. This is a method that is very effectual in destroying seed weeds, and particularly suits turnip-fallows, as it is a crop that requires a very fine tilth.

But modern improvements have discovered better ways of effecting these purposes. The turnip-fallows that received an autumnal ploughing should not be ploughed again till surface operations in March have stirred and loosened the earth, to favour the vegetation of weeds. This is best done by scarifying or scuffling. These tools will do their work if they are well constructed, to any depth the farmer may wish, and this tillage keeping the surface that has been pulverized by frosts, unburied, is much more favourable to the growth of weeds, than turning it down by ploughing. The work also is done much more rapidly, which, at so busy a season, is an object of great consequence.

LENTILS.

This crop is not uncommon about Chesterford in Essex. They sow a bushel an acre on one ploughing in the beginning or middle of the month. They make hay of them, or seed them, for cutting into chaff for trough-meat for sheep and horses, and sow them on both heavy and dry soils. The whole country is calcareous. Attention should be paid, not to water horses soon after eating lentils, for they are apt to hove. They are cultivated for the same purpose in Oxfordshire.

LETTUCES FOR HOGS.

I first saw the sowing of lettuces for hogs practised in a pretty regular system, on the farm of a very intelligent cultivator (not at all a whimsical man) in Sussex. He had, every year, an acre or two, which afforded a great quantity of very valuable food for his sows and pigs. It yields milk amply, and all sorts of swine are very fond of it. The economical farmer, who keeps many hogs, should take care to have a succession of crops for these animals, that his carts may not be for ever on the road for purchased grains, nor his granary opened for corn oftener than is necessary. For lettuce, the land should have been ploughed before the winter frosts, turning in by that earth 20 loads of rich dung per acre, and making the lands of the right breadth, to suit the drill-machine and horse-hoes, so that in this month nothing more may be necessary than to scarify the land, and to drill the seed at one foot equi-distant, at the rate of four pound of seed per acre. If half an acre be tried, or even a rood, near the farm-yard, the advantage will not be inconsiderable.

CHICORY.

This most hardy plant will do well whenever sown. It is indigenous over the greater part of the kingdom. There are several views with which this grass may more particularly be cultivated. 1. On poor barren blowing sands, such as many districts abound with, especially in Norfolk and Suffolk, it will yield a greater quantity of sheep food than any other grass at present in cultivation. Upon such soils, when they want rest and recruiting, there is no plant that equals this, which, if sown with a portion of cocksfoot-grass and burnet, will form a layer for six or seven years, far exceeding those of trefoil, white clover, and ray-grass, and will support so many sheep as very materially to improve the soil. 2. On fen and bog-lands and peat soils, it thrives to much profit. 3. On all land, whatever the soil, on which clover, from having been too often repeated, is apt to fail, chicory may be substituted to great advantage. 4. It does very well for soiling cattle, both lean and fattening. 5. It is of excellent use for those who keep large stocks of swine, whether by soiling or feeding in the field. 6. It does exceedingly well in an alternate system of grass and tillage, as it will last four, five, six, and even more years. Whenever it is the farmer's wish to lay a field to grass, by way of resting the land, or for increasing the food of sheep, he cannot hesitate. There is no plant to rival it. Lucern demands a rich soil, and will always be kept as long as it is productive, but upon inferior land it is not an equal object. It should not be sown with any view of making hay in this climate, though it forms a considerable proportion of many of the best meadows in the South of France and in Lombardy. Objections to it have been made, by reason of its rising, and becoming a vivacious weed, in succeeding crops. If the circumstance be not guarded against this will happen, but not more, or so much as with lucern. But who ventures to forbid that culture on account of this quality, which is really founded on its merit? When the land is ploughed, only use a broad sharp share, and harrow in tares, for feeding or soiling, or break it up for turnips, and there is an end of the objection. Such observations against a plant are truly futile, and arise only from ill management. Let us, therefore, suppose a farmer too wise to listen to them, and that he determines to sow the plant. He may do this broad-cast, among spring corn, in the same way that clover is sown; or he may drill it at nine inches on poor land, and at twelve on better soils, in order to give it now and then a scarifying; the first for feeding, the last for soiling. From 10lb. to 12lb. of seed per acre is the proper quantity. Once harrowing after sowing is sufficient.

BUNIAS ORIENTALE.

I have now (1808), had this plant three years in cultivation, for the purpose of raising seed for more extended experiment; and from all the observations I have hitherto made, I cannot but recommend it greatly to the attention of those who are solicitous to multiply their resources for the feeding of cattle, sheep, and hogs. I never saw or heard of any attempts to introduce it into field-culture; but it is a most promising article.

MUSTARD.

In breaking up the rich common of Marshland Smeeth, in Norfolk, the crop that was supposed to pay better than any other, was mustard. The soil is a rich silt and clay, worth 60s. an acre. They ploughed once, and harrowing twice, sowed a quarter of a peck of the seed per acre, from Candlemas to the end of March, according to the weather. Few farmers have a soil that answers for this crop, but it is necessary to name it, that if markets are promising they may at least have it in their mind. It may now also be added, that they hand-hoe the plants twice. The crop is reaped in the beginning of September, being tied in sheaves, and left three or four days on the stubble. It is then stacked in the field. Rain damages it. A good produce is six or seven coombs an acre: the price from 7s. to 20s. a bushel. They take three or four crops running.

MANGEL WURZEL

Is dibbled in this month, along the tops of ridges two or three feet wide, and which have been previously manured, and reversed to cover the dung. It is very little cultivated at present; but Sir Mordaunt Martin, of Norfolk, adhering to the cultivation, and finding the root very advantageous for his cows, it is right to name it in a work of this nature.

WOAD.

According to Mr. Cartwright, the middle of this month is the proper time to begin sowing this plant. I no more than name it, as all that a young farmer can, with any propriety, have to do with it, is to let some very rich grass-land to the travelling woad-men, who will give 4l. 5l. and even 6l. per acre, per annum, for liberty to cultivate it for two or three years. If he has such land, he will hear of them. In Somersetshire, they sow it in June.

CHAMOMILE.

This is an article of culture in Derbyshire: they choose a good loamy soil, well prepared, and plant the roots from an old crop. It remains three years on the ground. It is a troublesome culture, and by no means tempting in profit. To name it once is sufficient.

SCARIFY WHEAT.

This operation, which should not be delayed longer than March, is so material a part of the drill-husbandry, that much attention should be paid to executing it at the right moment, and also to doing it in the best manner.

Opinions are various, and many farmers do not approve of horse-hoeing at all, probably from having done it too late, or too severely. Mr. Cook has invented two implements applicable to this work, his fixt harrow and a scarifier. The former works merely by plain harrow teeth: it has three rows, and, by varying the position diagonally, one, two, or three teeth may be worked in the space of nine inches, without damage to the rows of wheat. If two, they may be drawn in a breadth of three inches; if three, in that of four inches, and these spaces widened at pleasure, but still so as to keep quite clear of the rows of wheat. By loading the harrow, the teeth are forced to the proper depth. The scarifier has teeth of various breadths, but for working at this season between nine or twelve inch rows, the narrowest are to be preferred. The intention of the operation now performed is, to loosen the surface earth and let in the air. The hoe of the scarifier may cut two inches deep safely. It will do this without raising any such surge of moulds as to bury the plants, and in its motion through the earth, it loosens without removing it. There the air immediately penetrates, and comes in contact with the roots, which, from the soil being moved, can spread with the greater ease.

Another motive for hoeing is, to loosen and pulverize the mere surface when bound by rain, or other weather. This has relation to the coronal roots of the wheat, which shoot out at this time of the year, when the seminal ones decay; and there is a curious circumstance noted by *Bonnet*, which is, these coronal roots striking not under the surface, but above it, into the air, and entering the earth at a small distance. It is then of consequence that the surface be in a pulverized state, to permit their free penetration. All hoeing before that moment must necessarily be beneficial, because it prepares the surface to receive these roots; but, if given *afterwards*, and so near the rows as to disturb them, it must do mischief for the time, as Nature has then her operation to perform again: and though the wisdom of Nature's Author without doubt provides for the case, as in that of the blossoms of wheat being blown off, yet a delay takes place, and a succession of injuries may be felt in the crop. The circumstance should at least induce the farmer to be early in his operations: if he is early enough, he may break the surface of a nine-inch interval, to the breadth of five inches, but afterwards he must recede from the rows, for fear of mischief.

These tools of Mr. Cook are very effective, and if used with attention, will be safe, while they dispatch a great deal of work in a short time. When, however, it is considered, that at this season, *in common management*, the teams are all in full employment, it must be admitted, that if there is much horse-hoeing to do, the common charge of a few pence per acre, is utterly inadequate for a period when a farmer would be glad to hire horses, could he get them at 5s. per day, and even at a greater charge; but if the modern system, of avoiding as far as possible, all spring ploughing, by the use of the same and other tools, be taken into the account, then the drill-husbandry will not demand more horses, possibly not so many. Whatever the operation, never loosen the *bottom*, for that should be left *firm* for wheat.

Towards the end of this month in some seasons, and all through April in others, wheat may be gently earthed up by hand hoes; it is not, however, common: and let it be remembered, that the husbandry is questionable. It encourages tillering, and if done too late, the crop will ripen unequally; the tillers will not be so early as the main stems.

HAND-HOE WHEAT.

If the farmer does not choose to practise the preceding operations of horse-hoeing his wheat, he must at all events hand-hoe the drilled intervals; but the same attention to earliness, is as necessary in this operation as in the former. If he gives the first hoeing early in this month, he may do it a second time the last week, or early in April.

HAND-HOE BROAD-CAST WHEAT.

There are several districts in the kingdom, in which this is generally done by every good farmer, and in some at a considerable expence. Some of the most careful and attentive cultivators, and men of much intelligence and observation, have however assured me, that they found mischief from it, and left it off: and I am much inclined to think, that if any such operation is intended, the wheat should by all means be drilled.

HAND-HOE DIBBLED WHEAT.

Two methods of dibbling will be explained under the proper month. The one is, planting two rows on a flag; the other one row, in which latter way there is an ample space for effective hand-hoeing, a method which answers exceedingly well. When wheat is thus put in, the farmer should on no account omit hoeing.

SHEEP.

At this season the stock, whether ewes, lambs, or fatting sheep, must be kept extremely well. If they are pinched now, all the money before expended will be nearly thrown away. Turnips can no longer, with any propriety, be depended upon. If the farmer has not a great breadth of rouen, or some other dependence, he must sell off his fatting sheep sooner than he desires, and stop the growth of his lambs, at a time when they ought to be half fat.

In fattening wethers, the great object is to keep from selling till the middle of April. To begin then, and keep killing till the end of May, is the most profitable conduct, for the price that a butcher will then give, exceeds what he would have given two or three months earlier. How advantageous is it, therefore, to have food ready to take all the stock by the middle of March, and to have enough to last till May.

SHEEP IN STUBBLE TURNIPS.

One of the resources for sheep-feeding, at this pinching season, is stubble turnips. A good manager, who finds a field of warm, forward, rich land, harvested early (whatever may have been the crop), will sow turnips, with a view to sheep-feed in March and April. If they are not sown early, they will consist of little more than shoots; but as they run up very rapidly at this time of the year, they afford much food, and are truly useful, at a season when every blade is valuable.

SHEEP IN ROUEN.

As turnips are by this time done, or ought to be done, the farmer will now find the immense importance of that reserve of kept grass, called *rouen* in Suffolk. All his ewes and lambs may now be in it.

SHEEP IN BURNET.

The autumnal growth of burnet may now be fed with sheep to great advantage, and prove of singular importance.

SHEEP IN SWEDISH TURNIPS.

This plant should no more be left this month, where it grew, than common turnips, for as the shoots for seed spring, they lay fresh hold of the earth, and exhaust it considerably. Such portion of the crop, therefore, as was not consumed in February, should be so early in March; but when the weather is mild the last week of February, they should then be removed to a grass field, for feeding. If, however, the land where they grew be dry, it is of such advantage to eat them on the spot, that another method may be pursued, which is a very good one, and that is, to draw them with one hand, and by giving them a chop with a knife by the other, to strike off the tap-roots, and drop them on the surface of the land. In this way, they will draw the soil infinitely less than when left undisturbed, and women do the work easily. Thus treated, the young white fibres are broken in drawing, which checks them, and though fresh shoots will push out from the part of the root in contact with the earth, still they will take some time, and be weakly.

COWS, &c.

Throughout this month the cows, lean and young cattle, should be kept close to the farm-yards, and on no account allowed to wander over any of the fields. If they even steal into a grass field, and it be a forward spring, so that they get a mouthful or two of grass, it will be a prejudice to them; for they will not be so well contented with their dry meat afterwards. Besides, they poach the grass, and lose manure. For these reasons, it is very advisable to have all the yards (I suppose water to be in them) locked up, and then it will not depend on the memory of servants. Every place must be well littered with stubble, straw, or fern; and it is to be remembered, that omitting this attention will be just so much mischief to every crop on the farm, in the article of manure.

At this season, a farmer who has weaned any of his calves, should observe that they be well and regularly attended. They should have a small yard with sheds to themselves, and have their bellies full of the refuse leaves of the cabbages given to the milch-cows, with whole ones, if these are not sufficient. Carrots are also of admirable use. Young cattle should be kept well, otherwise they will come to a very poor size. Their dry meat should be good cut chaff.

THE DAIRY.

This branch of the farmer's business must necessarily depend so much on his wife, if he has one who understands it, or on his dairy-maid, if his wife is ignorant, that his own share can be rarely more than a general superintendance, to see that every thing is clean, and that products and prices do not manifest neglect. The minutiæ of the dairy concerns would fill a volume, and, after all, would not probably be useful to any extent. Here and there a hint may be dropped, to bring certain points to his recollection; but all will at last depend on the practice and skill of the operator.

FATTING BEASTS.

Much attention should be paid to the stall or yard-fed beasts, in food, water, and litter. The young farmer will do well to weigh them, once a fortnight at least, before feeding in the morning, as this will tell much better than can be guessed by any one, except a most experienced hand, the degree in which they are thriving. If they do not keep advancing equally to preceding weighings, their food should be varied.

THE TEAMS.

A diligent farmer will now see that his horses and oxen perform a good day's work. In sowing time, he should not let them work less than nine or ten hours; but this he will not be able to effect, if the ploughmen have to take care of their horses. It is best to have horse-keepers for the mere attendance of the teams, so that the men who hold the ploughs may have nothing to do but the ploughing. Let the horse-keeper have the horses fed and harnessed ready for the ploughman, to be in the field by six o'clock. At eleven they should come home for an hour and a half to dine and bait, during which time the horse-keeper is in attendance again. At half an hour after twelve they should go out again, and work till half an hour after five, when the horse-keeper should again take the teams. By this method a pair of horses, in a well-made plough, will, without any driver, plough an acre and a quarter, or half, very easily; and no object is more important, than the ploughs doing good days work in the spring of the year. The consequence, especially of making the most of dry weather in March, is extremely great. One acre ploughed and sowed then, may be fairly worth two that are left till the beginning of May. From long observation of the value of dry seasons for tillage in this month, must arise the old proverb of—*A peck of March dust is worth a king's ransom.*

HORSES ON CARROTS.

This is a month in which carrots are in full perfection; they have now evaporated much of their moisture, and easily bend in the hand, being as it were withered. Then every ounce is nourishment, and they are fully as hearty as oats; insomuch, that horses that have had a month's carrots will refuse oats. To provide this root in ample quantity, for February, March, and April, is an object that ought never to be omitted.

WATER-FURROWING.

In all new sown or ploughed lands being wet, as soon as a field is finished, let the ploughs, before they leave it, strike the water-furrows, and send in men directly with spades to scour them, that is, throw out the moulds. In all lands sown with clover or grasses among the corn, these furrows should be dug a spit deep, and the moulds thrown carefully out. Many farmers are not attentive enough to this point. They only scour the furrows; but they should consider how long the grass is on the ground, which may be two or three winters, consequently it must be very material to the crop to lie dry all that time, which scouring alone will not effect. Particular attention should be paid to their spreading the earth they dig out of the furrows; if they be not cautioned, the men will lay it too thick, and hurt the crop; the earth should be spread with great care, and cut small, that the seed may rise freely.

POULTRY.

Much attention is necessary to all sorts of poultry this month; and as it is the first time of the subject being mentioned, it will be necessary to offer a few observations on the system which a young farmer may adopt with relation to this article of live stock. If, in the common way, he keeps but a few of each sort, that take their chance at the barn-door, for the convenience of eggs, and not to go to market when a fowl is wanted, no particular attention is requisite; but as, in some situations, they may pay well for more food and closer attention, it will be proper to bring a few circumstances to recollection. The poultry-house should contain an apartment for the general stock to roost in, another for setting, a third for fattening, and a fourth for food. If the scale is large, there should be a fifth, for plucking and keeping feathers. If a woman is kept purposely to attend them, she should have her cottage contiguous, that the smoke of her chimney may play into the roosting and setting rooms; poultry never thriving so well as in warmth and smoke; an observation as old as Columella, and strongly confirmed by the quantity bred in the smoky cabbins of Ireland. For setting both turkies and hens, nests should be made in lockers, that have lids with hinges, to confine them, if necessary, or two or three will, in setting, crowd into the same nest. All must have access to a gravelled yard, and to grass for range, and the building should be near the farm-yard, and have water near and clear. Great attention should be paid to cleanliness and white-washing, not for appearance, but to destroy vermin. Boiled potatoes are the cheapest food; and of corn, buck-wheat. Turkies, while young, demand incessant attention, and must be fed with alum-curd and chopped onions, for which purpose, store of those roots should be kept where they will shoot out and produce much food. If there be not great success in broods, and a certain high price, they will not answer, for the expences are heavy.

WATERED MEADOWS.

At the beginning of this month the crop of grass on the old floated meadows will generally be sufficient, Mr. Wright remarks, to afford an abundant pasturage to any kind of farming stock, and the water must be taken off for nearly a week, that the land may become dry and firm before the heavy cattle are admitted. It is proper, in the first week of eating off the spring feed, if the season be cold or rainy, to give the cattle a little hay in the evening to intermix with their moist food. But the grand application of the young meadow-grass is for ewes and lambs, and attention should always be paid to hurdling off the grass, and giving stripes across the meadow, exactly in the way that turnips are hurdled for sheep. The caution of Mr. Boswell, never to feed on these meadows any heavier stock in spring, than sheep and calves, seems to be judicious, but will, however, depend much on soil, for, upon a sound gravel, a practice may be admitted which would be mischievous on a peat meadow.

DESTROY MOLES.

This is one of the principal months for destroying this species of vermin, as they *run* more now and in April, than at any other time. Mole-catchers who do not keep farms clear by an annual contract, but are paid by the head, are too apt to neglect their business when their attention is of most consequence.

MANURE GREEN WHEATS.

February, March, and April, are the months for sowing top-dressings on the young wheats. There are a variety of articles which answer for this purpose, of which Mr. Farey gives a detail, as used in the vicinity of Dunstable, &c.

X

1. *Soot*, from coals, is bought in London at 7d. to 9d. per bushel, struck. The measure of London soot is very deficient, viz. about four-fifths of Winchester, which makes the price 9d. to 11d. per Winchester bushel, struck. It is brought from London to the lands, and there deposited in a heap (which is their practice also with the other light-dressings), at 3d. per bushel. From these heaps a common seed-scuttle is filled, and a man walking the length of the lands, sows the soot in the same manner as corn is sown. The expence of sowing is a halfpenny per bushel. The quantity used per statute acre, is from twenty to forty Winchester bushels. In general, thirty bushels are used for a complete dressing; *i. e.* when dung, or some other manure, has not been previously applied to the same crop, which is very frequently their practice, and the quantity of top-dressing is then diminished to about one-half of a complete dressing. Of soot, a complete dressing as above, costs 30s. to 36s. per acre. Soot is found to answer best on wheat in April. It likewise succeeds on pease or clover, in the same month, and has a good effect sown *with* barley in the beginning of April, and harrowed in. A slight dressing of soot is used at any time in the spring, when grubs or worms appear to injure the young corn. The worms frequently make great havock here, by drawing the blades of young corn

after them into their holes: this, soot prevents best. Soot thinly distributed on newly-sown turnips, *just before* they come up, prevents the fly or grub from injuring them, provided no rain falls to wash it into the soil. Soot answers best on light dry chalk soils, and in moderately wet seasons. It does little good on strong or wet land, or in very dry seasons, unless sown earlier than usual. The London soot from coals is rarely bought unmixed with cork-dust, coal-ashes, or sweepings of the streets; yet even in this adulterated state, it is found to answer much better than real country soot from wood.

2. *Coal-ashes* cost in London from 6s. to 14s. per waggon-load (narrow wheels and four horses), the price depending on the business doing in the brick-fields near town, in which considerable quantities of ashes are used. Carriage included, they cost on the land about 5½d. per bushel. Coal-ashes are bought in small quantities in the neighbourhood at 4d. per bushel, and collected to the land at about 1d. per bushel. They are distributed on the land with a shovel, from a cart or wheel-barrow, Another, and perhaps the preferable mode, is sowing them by hand. The former way costs 12d. per waggon-load, the latter 18d. Coal-ashes are used from 50 to 60 bushels per statute acre for a complete dressing, which amounts to from 23s. to 26s. per acre: they succeed well, sown on clover in March or April, on dry chalk lands; and also do much good on sward, applied during any part of the

winter or spring. They are never used on wheat. In very dry seasons coal-ashes do little good; they, as well as most other of these dressings on light land, require rain after being sown, to set them to work*.

3. *Peat-ashes*, brought from the neighbourhood of Flitwick on asses, are delivered on the land at 4½d. per bushel, struck; being distributed in the same way, and at the same expence as the last article. Forty bushels per acre is a complete dressing, and costs about 16s. Peat-ashes succeed well, used at the same time, and on the same crops as the last article, except that they apply it on wheat in April, with good effect. Peat-ashes greatly improve dry chalk soils, but will do little good on wet land, or cold sward, or on hot sandy lands. This, like most other of their dressings, is little affected by the season, provided wet falls soon after it is laid on the land.

4. *Peat-dust* costs the same as the ashes, and is sowed in the same manner and quantities. It answers equally well, and in every way the same as the ashes. Peat-dust is esteemed the best possible dressing for an onion-bed in a garden, and is not

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* In 1790, Mr. Dann procured from London the finely-sifted coal-ashes, which are sold there, and spread them, 45 bushels per acre, on clover and sainfoin, and the benefit was very trifling; but the ashes from Chatham Barracks (not kept under cover), and not finely sifted, have improved those crops to the amount of a load of hay superiority per acre. "The cinder, therefore," says Mr. Dann, "is better than the ash."

found to promote weeds more than other dressings. It has great effect on thistles, which it is scattered upon, causing them to wither, as if scorched; but they generally recover, unless the dust be repeated. The occupiers of the chalk lands in this neighbourhood are under considerable apprehensions for the loss of the valuable peat manures, by the proposed drainage of Prisles Moors, intelligence of which has reached them already.

5. *Folding* is used as a top-dressing, and on these, as on most other soils, answers to good purpose: it succeeds best on dry land. Its effect on these light soils is not entirely attributed to the sheep's dung, but in a great degree to the stiffness the land acquires by the treading, which is here found so very beneficial, that they frequently lead the plough-horses a-breast up and down the lands several times after sowing wheat, or other grain, to tread it.

MANURES TURNED IN.

1. *Furriers' clippings,* which are bought in London at 12s. to 13s. per quarter (being a ten bushel-sack crammed full) weighing about 2½ cwt. The carriage to the land costs 3d. per quarter. They are sown by hand from the seed-scuttle, at about 3d. per quarter, on the land intended to be sown with wheat or barley, and immediately ploughed in, after which the seed is sown and harrowed in, when such pieces of the clippings as are left above ground by the harrow, are pricked or shoved into

the ground with the end of a stick, to prevent their being devoured by dogs or crows, who seize them greedily. From two to three quarters are usually sown per statute acre. Clippings answer well on light dry chalk or gravelly soils, where they are supposed to hold moisture, and help the crop greatly in dry seasons. They have but little effect on wet soils.

2. *Horn-shavings*, which are of two sorts, *small*, or turners, and *large*, which consist of refuse pieces of horn. The small are bought in London in the same way, and generally at the same prices as the last article. The large shavings cost about 2s. less per quarter. Horn-shavings are used in the same way and quantities as the last article, except that they want no pricking, and the large are generally ploughed into the land three months before sowing wheat or barley. Horn-shavings answer in most soils and seasons, except very dry ones, when they will not work. The small shavings are much the most useful.

3. *Woollen rags* cost in London from 3s. 6d. to 4s. 6d. per cwt.: the carriage home 1s. per cwt. In the country they are bought at 4s. 6d. to 5s. and are collected at about 2½d. per cwt. The rags being generally in large pieces, are housed and chopped at the expence of 5d. or 6d. per cwt.: the extra expence of housing and carting to the land is about 4d. per cwt. They are sown by hand, and ploughed in three months before sowing wheat or barley: the quantity used is six to ten cwt. per

statute acre. Woollen rags, like furriers' clippings, hold moisture, and are adapted for dry, gravelly, and chalk soils, and succeed in dry seasons better than most manures, but they do little good on wet soils. London rags are found much better than those collected in the country; but the danger of catching the small-pox in chopping and sowing them, deters many farmers from their use.

4. *Sheep's-trotters* and *Fellmongers' cuttings*, are bought of the neighbouring fellmongers at about 6d. per bushel, heaped loose: carriage to the land is about 2½d. per bushel. They are used in the same way as furriers' clippings, from 20 to 40 bushels per acre, and need pricking in, as dogs and crows are very fond of them. They do not answer on wet land, or in very dry seasons: indeed nothing does succeed in excessive dry seasons on these soils. The trotters contain a considerable quantity of lime, and are often adulterated with sand, and sometimes large quantities of oak saw-dust are mixed with them, which has been found not to injure them.

5. *Malt-dust* costs at the neighbouring malthouses 1s. per bushel heaped, and about a halfpenny per bushel carriage to the land. It is sown by hand, from 24 to 32 bushels per acre, at the same time with barley, and harrowed in with the seed. It suits most soils and seasons. Malt-dust quickly spends itself, and is therefore never sown with wheat; as a top-dressing to wheat in March, about 30 bushels per acre, it probably would suc-

ceed on these soils. Black malt-dust, or such as falls through the kiln-plate in drying, is greatly preferred to the white, on account of the seeds of charlock *(sinapis arvensis)* with which it abounds, being destroyed by the heat. These chalk lands, under their present management, produce such abundance of charlock, that they are generally obliged to mow off the heads and flowers about the middle of June, to prevent its entirely smothering the corn. Charlock-seed so abounds with oil, that it will lay for any length of time in the earth without vegetating; which, however, it never fails to do, when brought near enough to the surface by the plough. Pigeons are supposed to pick up considerable quantities of charlock-seed after land has been ploughed. These lands are very subject to be over-run with black-grass *(alopecurus agrestis)*, which is said to impoverish it much.

6. *Pigeons' dung* costs 1s. per bushel heaped, and about a halfpenny per bushel bringing to the land: it is used as malt-dust, and does good in any soil or season.

7. *Soap-boilers' ashes*, or wood ashes from which ley has been made, is to be had (in small quantities only) at 6d. per bushel heaped, and costs about 1d. carriage: the effect of these on cold sward is very great.

8. *Hogs-hair*, which is sometimes to be had in London at about 9s. per quarter (the same quantity as furriers' clippings), and carriage 3d., applied in the same manner with clippings, answers well.

Seal-hair, rabbits'-dung, and *lime*, have been tried upon these soils, and found to answer no good purpose.

ALDER.

If a farmer has an alder-car on his farm, or stubs of them by a river, he should be attentive to cut them when the bark will peel, and immediately soak them two months in a pond. This hardens the wood to such a degree as to improve it greatly*. It merits experiment, to ascertain whether the effect would not be the same with other aquatic woods.

PARING AND BURNING.

This is the first month in which a farmer can execute the burning part of this operation, upon any large scale; but if the north-east winds prevail, which so much excel in the power of evaporation, and which often blow through the greater part of this month, it may go on without interruption. The cases in which this management ought to be embraced are so numerous, that a man cannot profit by many situations and circumstances he may be in, without the application of this admirable system.

Before we come to the distinctions of soil, it will be proper to offer some general observations, on the diametrically opposite systems embraced by such numbers of persons, on the general question, whether this practice is excellent or worthless, as two parties have decisively pronounced it.

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* Annals, vol. ix. p. 485.

By one set it is pronounced, contrary to every principle, that it is a wasteful, extravagant operation, which dissipates what should be retained; annihilates oils and mucilage; calcines salts, and reduces fertile organic matter into ashes of very weak efficacy; that the vegetable particles which are brought into play at once, for the production of a single crop, by less desperate management might be husbanded to the support of many. On the contrary, the advocates for this management assert, that these objections are all founded on vain reasoning and philosophical theory; that practice the most decided, and experience the most extended, pronounce it to be an admirable system: and that the mischiefs often quoted as flowing from it, are to be attributed merely to the abuse of the method, and by no means necessarily connected with it.

I must without the least hesitation declare, that the latter of these opinions is that to which I subscribe. To trust to reasoning in matters of agriculture, is a most dangerous reliance. I shall leave others to detail their philosophical speculations, and rest what I have to offer solely on the practice, various and extensive, of numerous agriculturists, and on the common husbandry of many spacious districts.

These agree in declaring, and it is most particularly to be had in remembrance, for the enemies of the practice admit it, that by paring and burning, you may command two or three good corn crops in succession. The fact cannot be denied; for whether you examine the peat of the Cambridgeshire fens, or the shallow chalk soils of the Downs and Wolds of Hampshire, Gloucester, and the East Riding, it is known that bad farmers do act thus absurdly. They get great crops, but they too often take them in succession, to the injury of the soil, though not to its ruin, unless that can be esteemed the ruin of land, which enables the tenant to pay a double rent for it. Such farmers have been in the habit of burning for wheat, and then taking two crops of spring corn; all good. Nay, I have known three good wheat crops had in succession. Now, it might be asked, how is it possible that that husbandry can have all the philosophical evils detailed above, of annihilation, dispersion, conversion and destruction, which enables a soil naturally poor and weak, to give two or three good crops of corn? Their argument evidently proves too much. The effect shews, that there is a powerful cause or agent in burning, which they do not understand; which escapes from the retort of the chemist, and from the *rationale* of the theorist. That operation or manure which will give a good crop of wheat, will give a good crop of turnips or cabbage; and he who, having made this commencement for the food of sheep on the land, and knows not how to go on, preserving the advantage he has gained, is a tyro in the art of husbandry. The farmers that are railed at, know it as well as their philosophical instructors; but avarice, united with the baneful effect of short, or no leases, make them practise against their judgments.

Paring and burning will, on all soils, give turnip or cabbage; these fed on the land by sheep, will secure barley or oats, and seeds; the seeds fed with sheep, whether for a short or a longer duration, will secure another crop of corn adapted to the soil; and in this stage of the progress, the soil will have gained much more than it has lost. To instance cases which I have seen, and to quote authorities for these assertions, would be tiresome. I could produce instances from more than half the counties of the kingdom.

It has been often contended, that burning lessens the soil. If this happen any where, it must be in peat; yet, in the fens in Cambridgeshire, this husbandry has been repeated once in eight years, for a century and a half, and the proofs of a loss of depth are extremely vague, in every instance I have met with, and hardly to be distinguished from that undoubted subsidence which takes place in drained bogs of every description. In all other soils the assertion may be safely and positively denied. I have calcined pared turf, not calcareous, after careful separation and weighing, and in a heat far exceeding what is ever given in denshiring heaps, and re-weighing, found the loss too minute to be attributed to any thing but loss of water intimately combined, but driven off by heat, and re-exposing the earth to the atmosphere, free from rain, have not found any diminution of weight. The vegetable particles only are reduced to ashes. Those particles, in any method of putrefaction, would dissolve, and combining with water, or evolving in gases, be exhaled by heat, or absorbed by the vessels of plants. In ashes, these are in a *more* fixed state, relatively to the influences of the atmosphere. That plants feed on them, the great crops which succeed offer abundant proof.

There are men who are timid in acknowledging truth, who admit the practice to be good in poor soils, and in peat, and sedgy bottoms, but fear it on better land. Experiment is against them, for in Yorkshire, land of 20s. and 30s. an acre, has been thus broken up with great success: but in what manner do they reason? Rich soils are full of vegetable fibres. Then there will be the more ashes. These are in proportion to the organic matter. Peat, which these men admit to be burnt, is the richest soil in the world, and therefore burning the most universally practised on it. The soil itself is not reduced; if it was rich before burning, assuredly it will be rich after it.

In addition to these circumstances, is the capital one, of destroying insects, grubs, and weeds. These are apt to abound most in the richer soils: no reason for abstaining from this husbandry on such.

I venture therefore to conclude, that paring and burning, with a proper course of crops, is safe on any* soil; and essentially necessary on some, as I shall presently shew.

Clay.—The gentlemen who have levelled their theories against paring and burning, have not given many reasons peculiarly appropriate to this soil. The only one that merits the least attention, is the assertion, that it converts what is properly soil, into pieces of infertile brick. The fact is not so, for every one that ever burnt clay for manure, knows, that though there are many lumps of the substance which they allude to, yet, that the mass of the heaps consists of ashes, properly so called; but when the tenacity of this soil, which is one of its greatest evils, be considered, it will be found, that bricks are an excellent addition to the soil, to loosen and open its stubborn adhesion. I have seen and examined carefully heaps of clay-ashes, amounting to many hundreds of loads, that have been burnt and applied to great profit on this soil. By paring and burning, you have therefore on it the common manure found in vegetable ashes, and you have in addition a substance which acts mechanically. Hitt, who wrote from practice, and whose writings abound with many just observations, remarks: "I recommend burning of the surface as the cheapest manure, and most effectual of any; for it not only adds salts to the soil, which the burning of grass roots produces, but it opens part of the stratum of clay next the soil so much, that the roots of vegetables can afterwards feed therein, for when the turf of a piece of land has been burnt in heaps, at four or five yards apart, though all the ashes be taken away, with some of the earth, and spread over the other parts of the land, yet neither corn nor turnips will grow so vigorously there, as on those places that were only opened by heat."

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* Very rich ones will do exceedingly well in many cases without it. This distinction, therefore, should be made. There *is*, in some cases, no *necessity* for it: there *is* in others.

Loam.—This is the soil, especially when good, upon which the practice has been most condemned; but here we have some experiments to recur to, which, in my estimation, set the matter in so clear a light, that nothing more is necessary than to recite them very shortly. Mr. Wilkes, of Measham, in Derbyshire, has for many years been in the practice of ploughing old rough pastures (the soil a stiffish loam), eight or nine inches deep, and burning the whole furrow in heaps of thirty or forty bushels each, the fires lighted by a few coals, and coal *slack*; the effect was very great, and the improvement immense and durable. Mr. Wilkes is of opinion, from the experience of many years, that even this burning, which is twenty times the depth of common paring, does not waste the soil in the least, but does no more than break the texture of stiff soils, expelling a great quantity of water; that by exposition to the atmosphere, the land re-absorbs its water, and by the great immediate fertility, fills itself presently with more vegetable particles than it had before. Thirty years ago, his father burnt, at Overseal, exactly in the manner described,

scribed, a field of ten acres, which was not then, and has not since been treated with any more favour than the fields adjoining, yet it has ever since retained a superiority.

The Writer of this Calendar, in 1790, hollow-drained an old grass-field of four acres and a half, of cold, wet, poor loam, on a clay marl bottom; the rent 9s. an acre, and not worth more in its then state, perhaps, than 7s. In 1791 he ploughed four acres of it four inches deep, which was the whole depth of the *soil*, or surface, of different colour from the stratum beneath, between that surface and the clay marl, and burnt the whole furrow of the part so ploughed. Having no coal-slack, and wood being dear, he made but four heaps in the field; the consequence was, the heat and degree of calcination were far beyond what is ever practised in common, and many persons who knew and approved of paring and burning in the common way, pronounced the field completely ruined. The ashes were spread, and ploughed in with a shallow furrow, and turnip-seed sown, and very slightly bush-harrowed. The crop was very fine, worth, to sell for feeding on the land, at least 50s. an acre. The crop on the burnt part double to that of the half acre.

After feeding them with sheep, the land was ploughed thrice, and sown with oats and grasses. The oats produced above seven quarters an acre, and the grass has ever since been much better worth 20s. an acre, than it was worth 5s. before. The oats on the half acre were not thrashed separately, but judged by those who viewed them, to be much inferior to the rest. About half the field has been since dressed with earth and road sullage, and once dunged slightly. It is remarkable, that in three years crested dog's tail, an excellent grass, common in the country, the seed heavy, and which, therefore, could not be carried by the wind, began to appear, and has been increasing ever since. There is at present no perceptible difference between the part burnt and the other not burnt; if any thing, the burnt is best. These two experiments prove, if any thing can, that paring and burning does not lessen the soil, in its most excessive application, and that it works a very great improvement on loams.

Sand.—Hitt, a practiser of this husbandry, says, that it improves sandy soils as much as any other; and I have seen some fields thus worked in Suffolk and in Cambridgeshire, and improved by it, though under a course of crops by no means admissible. There is not the least reason, from analogy, to doubt the effect on this, or in indeed on any soil. If the soil, however, is a very loose sand, and not well covered with turf, it does not burn well, the sand impeding the operation of the fire: this has been experienced in Bedfordshire.

Chalk.—Here we have a much more ample field of experience, for it has been, and is the common method of breaking up downs in every part of England. On the Cotteswold hills, in Gloucestershire, it is the common husbandry, and often repeated. The sheep-walks and warrens on the Wolds of the East Riding of York, and of Lincoln, have thus been brought most profitably into culture, though not with the attention in cropping that ought to have been given. In Hampshire and Wilts, the same husbandry prevails. In these counties I have been shewn lands that have been pronounced ruined by this husbandry. The cropping was bad, but still the rent had been doubled by the practice*. In Kent, Mr. Boys shall speak for himself. In a letter to the Editor of the *Annals*, he says, "If any persons who condemn paring and burning, should come into Kent this summer (1795), I can shew them several scores of acres of wheat, barley, oats, and sainfoin, now growing on land which has several times undergone that operation. The crops of sufficient value to buy the land at more than forty years' purchase, at a fairly estimated rent before the improvement." I humbly presume, that Messrs. Kent, Claridge, and Pearce, the great enemies of paring and burning, will not pronounce this land *ruined* by that *execrable practice.*

Peat.—This article is dispatched in few words. Whatever variety of sentiments there are on this method, for other soils, here there can be none,

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[*] In the West Riding, Colonel St. Leger remarks, that if burning wasted the soil, his limestone lands, only four inches deep, would have been gone long ago, as it had been pared and burnt for ages.—*Eastern Tour.*

The universal practice, from the flat fens of Cambridgeshire to the swelling bogs of Ireland, the mountainous moors of the north of England, the rough sedgy bottoms in almost every part of the kingdom, when they are broken up by men of real practice and observation, are always done by paring and burning. Registered experiments of doing it by fallowing, are to be met with in various works. The Board's Reports of the North Riding of York, and of Somerset, detail some; others are to be found in my Tours, and the result is either loss, or a profit so very inferior, that the question ought to be considered as settled and done with. Let it sleep for ever, except for the wrong headed individuals who will, upon every question, arise in every age, to contradict the common sense of mankind. I could detail cases without end, but really think it would be a loss of time to read them.

PARE AND BURN FEN AND BOG.

In the fens of Cambridgeshire, upon a peat soil, free from large roots and stones, the work of paring is always done with a plough, which they make on purpose for the work, and which executes it in the completest manner that can be imagined. It turns off a furrow, from 12 to 16, and even 18 inches broad, and not more than an inch deep. The use of this admirable tool brings down the whole expence of paring, burning, and spreading the ashes, to 9s. or 10s. per acre. But upon those soils, when they have not been in a state of cultivation, such a plough would not work.

PARE AND BURN OLD MEADOWS AND PASTURES.

These are done with the breast-plough, as it is called, which is pushed on by strength of body, the thighs being armed with wooden guards. It is hard work, and now commonly paid for, including burning and spreading, from 25s. to 50s. per acre. An inch is the common depth; but some farmers prefer two inches, for the sake of more ashes. The thinner it is pared, the more certain the burning, should the weather prove unfavourable.

PARE AND BURN HEATHS AND DOWNS.

Considerable tracts of this land, on a weak, thin, loamy sand, with a calcareous bottom, have, within the last five years, been thus broken up upon Newmarket-heath, which was done at the expence of 36s. to 45s. per acre, and immense crops the consequence, but in a very bad course, which will by and bye raise enemies there to this husbandry, though most unjustly.

PARE AND BURN MOORS, &c.

The moors and mountains of the north of England, Wales, Devonshire, &c. when broken up for cultivation, are often, and ought always to be reduced by this husbandry. It has long been common management in those countries, and is, therefore,

fore, done cheaper, from 24s. to 30s. an acre. Draining should precede it.

PARE AND BURN OLD SAINFOIN.

If a farmer has any old sainfoin layers that are worn out, and which he means to break up, let him determine to do it in no other method than this. If done by mere ploughing, the chances are much against success, by reason of the red-worm, which is very apt to abound in these layers, to the destruction of any white corn that can be sown. I have known three successive crops destroyed; but to pare and burn for turnips is the safest husbandry.

General Remarks.—In these several cases, there are some points of management which should be equally attended to in all. The heaps should not be made large, twelve or fifteen bushels of ashes are large enough; twenty may be admitted, but, if much larger, the turfs will be too much burned. This must, however, depend in some measure on the weather, for the worse that is, the larger the heaps must be. It will also depend on the thickness of paring. Thin flags will burn in smaller heaps than thick ones. When the ashes are spread, and the sooner that is done the better, the land is to be ploughed thinly, which is the general practice, lest the ashes be too much buried. If tillage be not immediately wanted, the ashes may remain spread, and the crop when sown, will be the better for this exposition to the atmosphere. Upon high moors, in undertaking new improvements, it may be of singular importance to gain straw. In that case, to sow oats upon the first burnt lands, may be admitted, but in general, it is much more correct to leave the ashes ploughed in for sowing turnips, upon all the land burnt in March, April, or May. This preparation is unexceptionable for potatoes, so that if this root be wanted, it may be planted in April on the land burnt in March.

LIME.

Liming is, in many districts, connected with paring and burning, and it is one of the best methods of applying this manure. From a peck to a bushel, according to its plenty, is added to and mixed with every heap of ashes, and they are then spread together. The effect generally is considerable, but proportioned to the soil. The greatest effect of this manure is upon land that has been long in a state of nature, and particularly upon all peat soils, moors, mountains, and bogs. But upon all on which it is known to have effect, it is well applied in the ashes of paring and burning. March is a proper season for liming in other cases, and he who has great tracts of land to improve, should be careful that his kilns continue working throughout the month.

CART DUNG.

The only crops for which dung from yards and composts should now be carted, are potatoes and cabbages,

cabbages. The first to be planted, and the other to be drilled, where they are to remain, in April. The time of doing it, whether now, or in that month, will depend on the pressure of other business; but the young farmer must remember that the work is to be done. Long fresh dung from the yards, will do for either purpose, probably better than any other. We may suppose that the land now lies in ridges of that size, whether of three or of four feet breadth, on which the crop is to be put in. The dung is to be laid in the furrows, from 25 to 35 cubical yards per acre. If very long and strawy, 40 yards, and the ridges being reversed, it lies ready to receive the seed.

In this husbandry, if the ridges be four feet wide, much attention should be paid to leaving the furrows freely open, and as deep as possible, effected by a double mole-board plough with expanding wings; this is of great importance, and especially if the dung be long. Many farmers are apprehensive of burying dung, but it is a gross error; at whatever depth it is ploughed in, its tendency is to rise into the atmosphere; were it buried six feet deep, the same effect would be the result; its gradual dissolution is produced by fermentation, converting it into gaseous fluids which rise through the superincumbent moles into the atmosphere.

HOPS.

This is the season to plant hop-cuttings, a branch of agriculture which, if treated much in detail, would fill such a volume as this work forms. I shall, in the seasons of the respective operations, remind the farmer of the work that should be in his recollection. No beginner in husbandry would introduce so operose an article of culture from any book. He would fix, for some time, in a hop district, to make himself acquainted with it, and procure an able, sensible workman, long habituated to it, to assist him in the undertaking. But as the article is here named, for the first time, a few cautions will not be improper, upon the general question of introducing the culture, where it is nearly or wholly unknown. Whoever has any thought of such an introduction, should duly consider several circumstances. He should of all others remember, that hops demand a greater acreable capital by far, than any other branch of cultivation. To form a new plantation, and go through the first year, will cost from 80l. to 90l. per acre, and the annual expence afterwards will vary, according to circumstances, from 30l. to 40l. per acre. Next he is to bear in mind, that a small insulated hop-ground does not usually flourish so well as a large one, probably for want of shelter. He is also to reflect on the great and constant demand for manure, which his situation may not enable him to command, without very much impoverishing the rest of his farm. He should reside in a populous neighbourhood, for the plentiful supply of hands at certain seasons of the year. He should consider well, whether the woods in his vicinity are productive of hop-poles, for if they are to be brought from a distance, the expence will be heavy. And lastly, he is not to forget, that after all his expence, attention, and exertions, it is one of the most uncertain and precarious crops that any man can adopt. These circumstances certainly demand his serious attention, however a plenty of hop-poles may tempt him, in some spots, to the speculation. I would advise a young farmer to think many times before he determines to undertake it.

There is one situation in which it may be prudent. He who possesses a bog, especially a flat deep bog in a sheltered spot, and yet not too confined, may very profitably convert it into a hop-ground. A solid, weighty peat-bog, makes an excellent hop soil, when laid into beds by transverse trenches. Such land is a natural dunghill, and will demand such manures as may, perhaps, be easily procured. Here the chances are favourable.

If such a spot be not chosen, the best preparation of the land for hops, is two successive crops of turnips or cabbages, both fed on the land by sheep, and off early enough for ploughing and planting the land in March. They may be planted in rows at eight feet asunder, and six feet from hill to hill, which will give full space for all the requisite operations. Three, four, or five fresh cuttings are planted in each hill, or spot which is to form a hill.

In this month old plantations are dressed, the hills opened, the roots pruned, and mould or compost returned. The time of poling depends on the shooting of the plants.

PICK STONES.

In a dry season, an opportunity should be taken this month, to stone pick the grass and clover fields intended for mowing. In this work, no stones are to be taken but such as would impede the scythe. The pickers, who generally like this work, will over-pick, if they are not attended to, and they will propose to pick other fields which are not to be mown; but on no account is this to be permitted, if the stones be not much wanted. It has been often remarked, and is a known fact, that too much stone picking has done a very sensible mischief, in many cases where picked by authority of parliament for turnpike roads. But Mr. Macro, of Suffolk, ascertained it experimentally. "Having often thought that picking the stones off my turnip lands did more hurt than good, I tried an experiment last spring, by gathering up all the stones of one square rod, after the turnips were folded off, and laying them equally over another square rod by the side of it, then sowed them with barley, and marked them out, and, at harvest time, collected them separately, as likewise another square rod by the side of them, which had only the natural quantity of stones.

	Qrs.	Pints.		C.	B.	P.
Produce from the rod that had the double quantity of stones,	6	1	or, per acre,	8	0	2
Ditto, from that where the stones were gathered off, ...	6	0	ditto,	7	2	0
Ditto, from that in its natural state, ...	6	½	ditto,	7	3	1

"From this single experiment the result is in favour of the largest quantity of stones; and I verily believe it is quite wrong, after the sheep have trod out a great quantity of stones, in feeding off turnips, to have them raked up clean, which I have known some farmers do, nor can the rake be used without taking some of the tathe, or dung, with them."

FEED NEW LAYS.

Lands laid down last August, or the preceding spring, with corn, should not have had a hoof in them through all the last autumn and winter. They will now present to the eye a beautiful fleece of young grass, of much value for sheep, and they are to be well stocked and kept down at present, and through all the following summer, by this stock only. Nothing is more pernicious than mowing a new lay, as directed by certain authors. They may have succeeded *in spite* of such bad management, but never *by* it.

SEED OATS.

Mr. Walker, near Belvoir Castle, Lincolnshire, sows eight bushels of oats per acre, and finds the crop much better, and the sample more equal than with less seed: the oats are less *taily*, no tillers to give different degrees of ripeness, and the crop ready to cut four or five days sooner than with thinner sowing. Mr. Ducket is of the same opinion, and holds no idea cheaper than that of recommending the drill husbandry as saving seed: he drills five bushels of oats per acre.

APRIL.

BARLEY.

THE barley crops not sown in March, should be in the ground by the middle of this month. The land I suppose to lie as thrown up in the autumn before; so that whenever sown, it is (on the old ploughing system) on the spring earth. This supposition is necessary; because, if there had been previous ploughings in March, or in the end of February, the seed should have been sown then; excepting, however, turnip-land, that broke up at first too rough to be sown, which will sometimes happen. The farmers, in some parts of the kingdom, will put off their sowing till the last week in this month, and the first or second of May, for the sake of gaining time for giving three spring earths; but they lose more by far from late sowing, than they gain by making their land fine. If clover is a principal object, and they had not the land fine enough before, delays must be made; but if so, that can scarcely be owing to any thing but bad husbandry; for such events should be had in view, and the tillage given before winter, on lands not cropped with plants that stand till the spring. The utmost exertions of good husbandry should be made to reconcile jarring circumstances, when they cannot be totally prevented.

But in the modern system of avoiding spring ploughings, with a care proportioned to the heaviness of the soil, the main reliance is on frosts for pulverization, and the object is to keep the surface so gained, for the seed to be deposited in it. If the weather was unfavourable for sowing in March, or, being favourable, the breadth was too great to allow the operation to be finished, and if weeds appeared in the lands laid up for barley, it is to be supposed that they were of course destroyed by the scufflers; and this month the sowing must be finished, whether broad-cast or by drilling. In the latter case, the directions relative to the right breadth of the stitches should have been very attentively executed. The young farmer must have it carefully in memory, that as the summer approaches, with hot suns at intervals, any degree of poaching, or daubing, or trampling, becomes more and more fatal, for the sun binds whatever earth was touched in too wet a state. This caution has little to do with the occupiers of sand, much of which wants adhesion to be given it by art; but here, again, if such land has been amply clayed, it will sometimes be apt to *set*, to bind with heavy rains, so that the temper of it should always be examined before the teams at this season are permitted to go on it.

PEASE,

Should always be put in before this season, and therefore directions are omitted here; but if, from some peculiar circumstances, the farmer wishes now to sow a field, I need only remark, that they may still be sown, with the expectation of a full crop; but it may prove too late to have good turnips after them.

WHITE OATS.

It is the custom in Hertfordshire to sow barley before white oats. Wherever such maxims prevail, this will be the principal month for sowing oats. All the precautions that have been given with respect to barley, are equally applicable to this crop.

BUCK-WHEAT.

The lands designed for buck-wheat in May or in June, should be well tilled this month, ploughed and harrowed well at least once. It is not necessary for that grain, but for the grasses which should be sown with it, and for the important object of making all the seed-weeds grow, in order to kill them by the following tillage. This April preparation marks the land for buck-wheat. I shall therefore take this opportunity to advise the farmers in general to try this crop. Nineteen parishes out of twenty, through the kingdom, know it only by name. It has numerous excellencies, perhaps as many to good farmers, as any other grain or pulse in use. It is of an enriching nature, having the quality of preparing for wheat, or any other crop. One bushel sows an acre of land well, which is but a fourth of the expence of seed-barley. It should not be sown till the end of May. This is important, for it gives time in the spring to kill all the seed-weeds in the ground, and brings no disagreeable necessity from bad weather in March or April, to sow barley, &c. so late as to hazard the crop. It is as valuable as barley. Where it is known, it sells at the same price, and, for fatting hogs and poultry, it equals it. It is, further, the best of all crops for sowing grass-seeds with, giving them the same shelter as barley or oats, without robbing.

BEANS FOR EATING GREEN.

If Windsor beans are cultivated with this intention, a portion of land should now be planted with them.

LETTUCES FOR HOGS.

If the stock of swine be large, it is proper to drill half an acre or an acre of lettuce this month. The land should have been *well* manured and ploughed before the Christmas frosts, into stitches of the size that suits the drill-machine. It should also have been scuffled in February, and again in March, and well harrowed; and this repeated before drilling. The rows should be equi-distant, one foot asunder.

The crop which was drilled in March (a succession being essentially necessary) should now be thinned in the rows, by hand, to about nine or ten inches asunder. If this necessary attention be neglected, the plants draw themselves up weak and poor, and will not recover it. Women do this business as well as men. When about six inches high, they should be horse-hoed with a scarifier or scuffler, with the hoe about four inches, or at most five, wide.

SPRING TARES.

If the young farmer depends in any degree upon a succession of tares, he ought to have two sowings, one at the beginning and the other towards the end of April. To have these crops to follow one another in consumption, is a very material object. Two bushels and a half of seed per acre are a proper quantity.

SPRING WHEAT.

I cannot in general recommend the culture of this grain, for barley or oats commonly pay better; but as certain circumstances may render it very profitable, it is proper for every farmer to have the object in his mind. Mr. Marshall has a useful minute on it.

"Spring wheat *(triticum æstivum)* is here cultivated, and with singular success; owing principally to the time of sowing: the wane of April! This proves that it is a species widely distinct in its nature from the winter wheats. In the practice of a superior manager (Mr. Paget, of Ibstock), it was discovered, that by sowing early, as the beginning of March, the grain was liable to be shrivelled, and the straw to be blighted; while that sown late, as the middle or latter end of April, or even the beginning of May, produced clean plump corn; effects directly opposite to those of winter wheat.'

STEEPING SPRING CORN SEED.

In case of an unfortunate season, by reason of a drought to an uncommon degree, it should be recollected, that steeping barley and oats, &c. has been tried with success. It is a practice rarely necessary, and mentioned here only as a hint, which a farmer may apply now and then to advantage.

MADDER.

This is the principal season for planting madder. I suppose the deep tillage to have been performed in October, and the land to have been thoroughly water-furrowed. Early in this month it should be ploughed again, and harrowed fine; and towards the latter end of it another earth should be given, and the land harrowed again. It is then in order for being planted.

Great attention must, however, be paid to this tillage being all given in dry weather. If the soil is moist, or apt to bind, scarifying and scuffling will be superior to ploughing.

The sets are to be slipped from an old plantation. When they are about two inches above the ground is the proper size, and they should be slipped off as much below the surface as possible; because they will then have the better chance of growing; and as fast as they are taken up, they are to be thrown into tubs of water. Other hands are to be employed in planting; in which work the cultivator of this crop must be ruled by the method of disposing the beds. That which was practised when (more than 30 years ago) the Society offered premiums, is equally-distant rows, two feet asunder, the land flat. If, for laying the land dry in winter, ridge-work is preferred, only one row, of three feet, can be set on each. On four-feet ridges, two rows at nine inches, or one foot, may be planted. The planting should be performed with care. Women or children should drop the sets, and men follow to plant them. In this month there can be no danger of their not growing, especially if the land is in as good tilth as it ought. Watering will scarcely ever be necessary.

Let the young farmer, however, remember, that the culture of these plants, applicable only to the use of manufactures, and which are also largely imported from abroad, is rarely advisable. I was a madder planter once, and lost by every acre I planted. A man may plant in the moment of a high price, and take up his crop, three years after, at a low one. All such speculations are too hazardous; nor was there ever a fair open competition among the purchasers.

Those who have cultivated madder with the success boasted by the writers of husbandry, should not hold these observations in contempt. There appears to me almost as much use in mentioning trials that were unsuccessful, as in those that are the most profitable; for it is certainly of as much consequence to tell one man that his soil *will not do* for madder, as to assure another that his *will do*. Instead of an acre or two, I might possibly have launched (like many others) into 10 or 15 acres, in which case the loss would have been no trifle. And it surely is highly incumbent on every one, to make known to the world such of his experience as will probably be of any use to it. Bad success, however, of several persons in a culture, is too apt to prejudice others *in general* against it. However irrational, still it is so, and it ought to be a caution not to recommend any thing in general, under the extravagant notion, that because an article of culture is profitable on one soil, it must be the same on very different ones. But the grand obstacle to the culture of madder is the difficulty of sale: for while a man has not a fair market for his unmanufactured madder, none can, with any prudence engage in it, unless on so large a scale as to admit the whole apparatus of reducing it to such a state, as to be absolutely a marketable commodity. In answer to this, it may be said, that madder really dry is a *marketable commodity*. But this matters not, if the purchaser has it in his power to be a knave: he has a pretence, a screen always at hand, that will cloak the greatest knavery, and to a degree known in no other branch of agriculture.

culture. Among the gentlemen of trade who have a mutual understanding and confidence, such objections appear trivial; but to the cultivator, at a distance from the market, it is a different affair. He writes to a madder-merchant to know the price. The answer is, *four pounds an hundred weight.* Up he sends his madder, and instead of 4l. receives but 3l. not from a variation in *price*, but in *weight.* It may be said, that the correspondent in London may be in the right. Very true; but will the countryman believe it? He thinks himself right, and has no other proof that he is not so, but the interested assertion of the man who buys it. Is it not evident, that in such a case the cultivator will be disgusted, and throw aside a business in which he knows neither the market weight nor the market price. If encouragement is designed to this culture from any quarter, it should not be exclusive of this circumstance: manufactories should be erected and established, in which the madder could be prepared for any one at so much an hundred weight, and that by persons not the least concerned in purchasing. Then the cultivator would have a commodity in his hands which he could sell in as simple and fair a way as any other. If nothing of this sort can be effected, all encouragement should be for such a number of acres (and no less) as will answer the expence of a private manufacture, which would prevent persons being unguardedly drawn in, by premiums apparently considerable, to cultivate a root which, when raised, is in its sale absolutely at the mercy of the purchaser.

I am informed, that at present (1803) the largest quantity of madder used in our manufactures, is used without being powdered, as formerly, and that it is saleable with common drying, without stove-work; but that *common degree* is open to much uncertainty, so that the preceding remarks are not done away. The price of 4l. per cwt. marks a considerable desiccation.

LIQUORICE.

The liquorice culture is generally carried on more completely than that of madder, which is owing to the nature of the root. Madder spreads its roots horizontally more than perpendicularly; so that good tillage, and plenty of food on the sides of the bed, make amends for depth; but this is very different with liquorice, whose root is a single tap one; so that the whole crop depends upon the *depth* of cultivation. Hence we find, that the planters dig the land four feet deep. This appears vastly expensive, but it is greatly lowered by always planting on the same land, so that one digging does for taking up one crop and planting another, a saving that renders this culture preferable to ploughing. The perpendicular growth of the crop also makes it necessary to plant the sets much nearer than madder ones. For instance: double or treble rows, at nine inches, with two feet spaces for hoeing.

TEASELS,

TEASELS,

Or the Fuller's Thistle. They are sown in April; two pecks an acre. The young farmer, should he wish to make trial of this branch of the art, may consult Mr. Billingsley's account of it in the Somersetshire Report.

LUCERN.

This is the right season for sowing lucern, which must now be considered under the several heads. 1. Of the utility of the crop, which should induce a young farmer to enter freely on the culture. 2. The soil to be chosen. 3. The preparation. 4. The mode of sowing. 5. The quantity of seed. 6. With or without corn.

1. It is an object of such consequence to those who have a proper soil for it, that it does not admit of doubt or question: but, if a beginner in husbandry has apprehensions, let him mount his horse, and travel near the coast of the Thames and sea, from Dartford to the limits of Hampshire, and he will hear of lucern all the way, and see much of it. The principal, and probably the best use, to which it can be applied, is that of soiling all the horses on the farm; next, to soiling cows, young cattle, and fatting beasts, soiling hogs, and, lastly, making hay. These are objects of such consequence, that they ought to be provided for; the last, however, in proportion to the meadow-grounds of a farm, and to the sainfoin which may be on it.

Where these abound, lucern for hay is the less necessary. The importance of a general system of soiling can never be impressed too frequently. The repetition and influence of the benefit pervades every crop on the farm. Inasmuch as dung is important, this practice is so. Dung, without it, is made during half the year; with it, through the whole, and he only who knows the immense consequence of raising dung, can duly appreciate the necessity of soiling.

2. The soils that suit lucern, are all those that are at once dry and rich. If they possess these two criteria, there is no fear but they will produce large crops of lucern. A friable deep sandy loam on a chalk or white dry marley bottom, is excellent for it. Deep putrid sands, warp on a dry basis, good sandy loam on chalk, dry marl or gravel, all do well; and, in a word, all soils that are good enough for wheat, and dry enough for turnips to be fed on the land, do well for lucern. If deficient in fertility, this circumstance may be compensated by manuring, but I never yet met with any land too rich for the plant.

3. The best preparation for this, as for all other grasses, is two successive crops of turnip or cabbage, both fed on the land, and the last before the sharp frosts are over. This management frees from all weeds better than any other, and at the same time greatly enriches. Upon land previously clean, one of these crops may do well enough;

but let not a farmer ever venture lucern upon land that by some method, whatever it may be, is not rendered quite clean.

4. In regard to the mode of sowing, the greatest success by far that has been known, is by the broad-cast method, which is nearly universal among the best lucern farmers, even among men who admire and practise the drill husbandry in many other articles. But as they mostly (not all) depend on severe harrowing, for keeping their crops clean, which is a troublesome and expensive operation, I shall venture to recommend drilling, but very different drilling from that which has been almost universally practised, viz. at distances of 18 inches or two feet. Objections to these wide intervals are numerous. If kept clean hoed, the lucern licks up so much dirt, being beaten to the earth by rain, &c. that it is unwholesome, and the plants spread so into these spaces, that it must be *reaped*, which is a great and useless expence. For these reasons, as well as for superiority of crop, I recommend drilling at nine inches, which, in point of produce, mowing, and freedom from dirt, is the same as broad-cast; and another advantage is, that it admits a scarifying once a year, which is much more powerful and effective than any harrowing. These facts are sufficient to weigh so much with any reasonable man, as to induce him to adopt this mode of drilling, as nearer to broad-cast by far than it is to drills at 18 or 24 inches, which open to a quite different system, and a set of very differ-

tant evils. Nine inch rows might, *practically*, but not literally, be considered as broad-cast, but with the power of scarifying.

5. In regard to seed for nine inch drilling, 15lb. is to be recommended.

6. The material point, of with or without corn, remains to be spoken of; and here two considerations present themselves. One is, the extreme liability of lucern to be eaten by the fly, which does great mischief to many crops when very young, and against which the growing corn is some protection. The value of the barley or oats is another object, and not to be forgotten. It is also gained in the first year's growth of the lucern, which is very poorly productive, even if no corn be sown, so that I must own myself clearly an advocate for drilling it among corn, either between the rows of nine inch barley, or across drilled barley at a foot; perhaps the latter the best method, as there is less probability of the crop being laid, to the damage of the lucern. The quantity of seed-corn should also be small, proportioned to the richness of the land; from one bushel to a bushel and a half, according to the fertility of the soil; another security against the mischief of *lodging*. If these precautions are taken, it would be presumptuous to say that success must follow, *that* being always, and in all things, in other hands than ours; seed may prove bad, the fly may eat, and drought prevent vegetation, but, barring such circumstances, the young farmer may rest satisfied that he has done

what can be done; and if he does succeed, the advantage will be unquestionable.

SAINFOIN.

There are parts of this kingdom, in which the farmers could not pay their rents without the use of this grass. On dry limestones and chalky soils, or on any land perfectly dry and sound, it will thrive to extraordinary profit. It may be safely sown in April. The land should be clean, and free from weeds and the seeds of weeds; and this is the principal circumstance to be attended to. It should be sown with barley or oats, the land in fine tilth, and the seed covered by harrowing when the land is dry. It may also be drilled as in March. Upon the soils proper for this grass, no man can sow too much of it; for no other use of the land will pay nearly so well. It will, on poor soils, not worth more than from 2s. 6d. to 5s. per acre, yield a ton and a half, and even two tons and a half of hay, or a ton at the least, at one mowing per acre, and afford a considerable after-grass besides. Now, the use of hay is so universal, that such products can never want a market; nor such land, thus improved, fail of becoming a source of profit to whoever pursues such a beneficial conduct. The products and profit of such land in tillage, or in a sheep-walk, are quite inconsiderable, compared to what sainfoin yields. The proper quantity of seed is four bushels per acre. It flourishes so well broad-cast, that there is no *necessity* to attempt it in the drill method.

I have seen it cultivated, however, with great success, drilled at nine inches across drilled barley, on the farms of Mr. Coke and Mr. Overman, in Norfolk.

BURNET.

This is a proper season for sowing burnet; and the best method of cultivating it is, to sow about a bushel per acre, with either barley or oats, and to cover it at two harrowings. It flourishes extremely well on most soils; but it yields a produce proportioned to the goodness of the land, though it will do on those which are very indifferent. The great use of it is for spring feed for sheep. If left of a proper height in the autumn, it will improve through the winter, notwithstanding frost, and be ready early in the spring. This is a great excellency, in which it is rivalled by no other grass. Burnet does well mixed with ray-grass or cocksfoot: about three pecks of burnet, and one bushel of ray-grass, or cocksfoot, to the acre.

SOW CHICORY.

This plant (most valuable for many purposes) may be sown with any sort of spring corn all through this month. It may be put in either broad-cast, sowing 12lb. of seed per acre, or drilled at a foot distance, with 9lb. or 10lb. over broad-cast, or drilled corn.

LAYING DOWN FOR GRASS.

Laying arable land down to permanent grass, is a work very rarely thought of by tenants. I have known it sometimes done on a piece near a farm-yard, for convenience, but not often. As this work is designed equally for the use of both landlords and tenants, it is necessary to mention all the practices commonly pursued by either. I treat of the *preparation* for it under this month, because the spring is, with many, the favourite season for that operation; but, as I greatly prefer an August sowing of grass-seeds for this purpose, I shall be brief at present, reserving my principal observations for that month. When sown with spring corn, it should be with buck-wheat, barley, or oats. Seeds take better with buck-wheat than with any other crop, but April is not the best time for this plant. Should it prove *blind*, as the farmers call it, that is, blighted and abortive, from frosts, the crop may be mown for hay or for soiling. Seeds succeed, however, very well with barley or oats; and the chief caution is, to prepare the land in such a manner as to render it perfectly clean. Two successive crops of turnips are the most effective way of securing this degree of cleanness. In the Calendar for August, this point will be further considered, and the proper seeds to be sown specified.

SHEEP.

This is the month that tries the farmer more than any other in the year. In the whole range of husbandry, there is no point that puzzles the farmers more, than providing for their flocks through March, April, and the first week of May. It proves the good husbandman as much as any other article in the most extended farm. The common management is to depend on turnips and hay; and, when the former are done, to turn them into a piece of rye sown on purpose, or into the crops of wheat, to feed them off. These resources not being proportioned to the want, they let them run over the clover and pastures of the farm; by which means the crops of hay, and pastures for large cattle, are greatly damaged. Bad as such a system of management undoubtedly is, yet it is too often to be met with, and the bad consequences are felt so strongly, that the number of sheep on such farms is governed by the food in April. Few farms are stocked properly with sheep throughout the whole year, for want of more food at this season. But there are some farmers, who have felt these inconveniences so strongly, that they have taken steps to remedy them. They keep their turnips as long as possible, so as to make their shoots an object of sheep-food; and every year they sow a piece of clover and ray-grass on land in pretty good heart, to be ready in the spring to take their flocks from turnips, and keep them till the general turning to grasses arrives. This conduct, I must observe, is an improvement on the other, for it gets rid of three great evils: depending on rye, which is soon eaten; feeding on wheat, which is pernicious to the crop; and turning too soon into the general pastures. But, at the same time that it effects this advantage, it is open to some objections, which make further improvement necessary. Keeping the turnips long in the spring is very bad husbandry. It damages greatly the barley crop, both in robbing the land, and preventing it from being sown in proper time; nor is the food of great consequence; for many acres of turnip-tops are requisite, the number of which must be in proportion to the stock of sheep; and, as to the roots, they grow so sticky and hard after the tops are at all advanced, that their value is trifling. With respect to ray-grass, the clover mixed with it is seldom above three inches high at this season; and a great breadth of ground to a given stock, must be assigned to keep the sheep through April. The number of acres of that young growth necessary to keep an hundred sheep and lambs is surprizing: so that these farmers, although they manage to spring feed more sheep than the worst of their brethren, yet effect it at a great expence, and at last not in any degree comparable to what might be done.

A turnip should never be seen on the ground after March. For the month of April, the farmer should have a field of cabbages ready, which, yielding a great produce on a small breadth of ground, reduces the evil of a late spring sowing; and, if he manages as he ought, totally excludes it. The turnip-cabbage, and ruta baga, will last as long as

wanted;

wanted; and, though it runs to seed, yet the bulb will not be sticky. The green boorcole may be fed off several times. It is impenetrable to frost, and will make shoots in the winter.

Another crop for feeding sheep in spring, which is of particular merit, is burnet. An acre of it, managed properly, will at this season yield much more food than an acre of clover and ray-grass. It should be four or five inches high in November, and left so through the winter. Burnet has the singular quality of maintaining its green leaves through the winter: so that, under deep snows, you find some luxuriance of vegetation. From November to February the crop will gain two or three inches in growth in the young leaves, and then be ready for sheep. It will be better in March, and if kept, ready in April not only for sheep, but for horses, cows, or any other stock.

SHEEP IN ROUEN.

But before all the preceding dependencies, may be reckoned kept after-grass, on dry meadows and pastures. If a field of this rouen be seen at any distance, it appears most unpromising, being of the colour of very bad hay; but enter it, and turn aside this covering with your hands, and the young green growth is found five or six inches high, nursed up by the shelter and warmth of the autumnal growth. I have often shewn this to persons on my own farm, to their great surprize. The sheep eat both together, and it is found to agree with them remarkably, being, as it were, hay and grass in the same mouthful. I do not conceive that it is possible to keep a full stock of sheep so cheaply in April, by any other method as by this: Tolerable rouen will carry ten ewes an acre, with their lambs, through this whole month. Such rouen may be worth, in autumn, 10s. or 12s. an acre. In April it is worth 30s. or 40s. and if it be a backward season, a farmer that has it would not be tempted to sell it for much more.

SHEEP IN WATER MEADS.

The farmer who has a good breadth of these, may depend absolutely on them. He wants nothing else for sheep and lambs.

SELL FAT SHEEP AND BEASTS.

Markets for beef and mutton, are usually as high towards the end of April as at any other moment in the year. At that period, the supply can come only from corn or cake-fed beasts, for not one farmer in a thousand has then any winter green-food remaining. Any beasts really fat, are then sure to sell well at Smithfield. With sheep, the case is rather different; for spring food is now come to him who is well provided, but not in such plenty, on account of the number of bad managers, as to lower the markets.

SMITHFIELD.

It is proper for a young farmer to consider well the various ways by which he turns his fat stock into money. The first and chief of these is Smithfield market. If he lives in a district divided into small or middling sized farms, and where the graziers are all or mostly in a regular system of employing one or more district drovers, in whom great confidence is placed, he is as safe as his neighbours, and may not have reason for any particular caution. This is very much the case in East Norfolk. If he occupies a very large farm, of whatever kind, whether an arable-grazing one, as in West Norfolk, or a grass-grazing one, as in Lincolnshire, on a scale that enables him to send many droves pretty regularly to his salesman, he may safely trust to him. The common confidence and integrity of trade then take place. But I am sorry to observe, that I scarcely ever knew a man send accidentally a lot of beasts or sheep to Smithfield, that got as fair a price for them as his great neighbour, who was in constant dealing, got the same day; or his little one, whose stock took the same chance through the means of a confidential drover. The man who thus drops in a lot, out of the regular course of his business, is rarely satisfied with the treatment he receives. There must be a great deal of truth in this remark, because it has been made to me from so many different quarters, and I have suffered in this way myself.

Let the young grazier, therefore, consider the circumstance well, try the country butchers, and feel his way through the difficulty, if his farm be of that size, and in that situation, which lays him open to its influence. The possession of an engine for weighing beasts alive will be extremely valuable to him: for, by comparing the live with the dead weight, when the beasts are killed in the country, he will soon be convinced of the truth of the many comparative accounts of live and dead weight, which are published in the *Annals of Agriculture*, and from which he will be able to ascertain correctly the dead weight of any common sized bullock of which he knows the live weight. He may also compare the result when the live weight is taken, from Renton's measurement. As to sheep, calves, and hogs, weighing is done with the utmost ease; for a cage with a door at each end, and a large pair of steelyards, form the whole apparatus necessary. He should never fatten any animal whatever, without regular weighings, by which means he knows how his stock (whatever it may be), thrives, what changes it is requisite to make in their food, and when to sell, if markets suit. All these are very material points, and he will have much satisfaction in being at any time able to ascertain them. Old and very experienced graziers can do without these helps, but they often suffer for want of them. To young ones they are essential. But let a grazier be as experienced as he may in buying and selling, and judging by the hand and eye, the butcher will beat him, from having been able to bring the live to the test of the dead weight, in such a variety of cases, that his knowledge is perfect. The grazier cannot equal him, but his nearest approximation will be by means of carefully weighing.

COWS.

It is no great object to a good farmer to get his cows out of the farm-yard this month, if he has a provision of ruta baga and chaff, as he ought. He must be very amply provided with grasses, indeed, to do it to good purpose, as his flock of sheep must be the first object for spring food. Besides, the raising of great quantities of manure in the farm-yard, is so important an object, that he should keep it in sight as long as possible. Turning out any cattle, before there is a good bite for them, is unprofitable; for a field so begun will not last proportionably with another of a proper growth. The milch cows should have their bellies full of roots and cut straw throughout this month, and be always kept well littered both in the yard and in the house.

HORSES.

The horses ought to be kept in the stable throughout this month, and to have plenty of litter, that they may continue to raise much dung. This is so busy a time, that a close eye should be had to the work that the teams perform, as one day now is worth two by-and-by. The directions laid down for last month, on that head, are to be followed still.

MARES FOALING.

Mares should have the horse so as to foal as nearly as may be in this month: the end of which, or the beginning of May, is the most advantageous time. They go 12 lunar or 11 calendar months. When expected to foal, a mare should be shut into a small paddock or pasture, so perfectly safe respecting fences, and freedom from dangerous holes and ponds and ditches, that the foal may be free from the possibility of losing its life by accidents touching all local circumstances that may hazard it; for want of such a pasture, into a clear outhouse or stable, but not haltered to any thing. If she betrays any signs of illness she should be kept in such a house till well, and have warm water with bran, and two mashes a day of oats, bran, and malt, in equal quantities, with the best of hay in her rack. If well, she and her foal should be turned into good sound pasture, where likely to be quiet.

FEED TEAMS ON CARROTS.

Throughout this month the teams should depend on carrots, which are now in that dry withered state, in which their use is incomparably valuable. They are more hearty and nourishing to horses than any other food. Each horse may have two bushels a day, which will be about the quantity they would eat were there no limitation of allowance.

OXEN.

The ox teams being kept to pretty sharp work at this season, should be well fed with good hay, straw, cut chaff, and a daily allowance of roots. If they are large beasts, they should have fifty pounds of cabbages each, every day. This is a use, among many others, that will be found to shew the great consequence of having plenty of roots, &c.

HOGS.

The fattening swine, sows, pigs, and lean hogs, require good attendance. There being nothing yet for them in the fields, they must be kept close to the farm-yards, where the thrashers (who should be kept at work quite through this month) will partly supply them with food, and the wash cisterns and winter stores of carrots, parsnips, potatoes, &c. will keep them in good heart.

POTATOES.

In the latter end of this month, the land that was planted early with potatoes should all be hand-hoed over the whole surface, to cut up weeds clean, and loosen the earth. This management is known only in the neighbourhood of London, but it should be extended over the whole kingdom, for the excellence of it is indisputable. The expence of hoeing,

ing, when there is a clear space to cut, is trifling, and the succeeding cleaning which the potatoes receive after they are up, is performed at a much less expence on account of this operation, and at the same time in a more effectual manner.

But the cheapest and most effective method of performing this necessary operation is by a large shim, which cuts three or four feet of surface. For this purpose, there should be a small broad wheel at each end of the beam, to regulate the depth. The work is confined to the surface, the intention of it being merely to cut up weeds and to loosen the earth, which rain and succeeding sunshine may have encrusted. The operation is of great importance, and will lessen the expence of the following hoeings.

BREADTH PLANTED.

Before a farmer determines what breadth or number of acres he will plant with potatoes, he should consider several circumstances; as the number of acres of carrots he has sown; for if his soil be suitable to that crop, they are greatly to be preferred to this root, being cheaper, not requiring dung, and being applicable to all the uses to which potatoes are applicable. They do not at all impoverish the land, whereas potatoes scourge it, if the expression be permitted, more than any other crop the farmer puts in. These are very material motives to influence a preference. But if the soil will not suit carrots, then it will be necessary to plant so much the more land with potatoes. The same observation may be applied to cabbages, which also, in a great measure, answer the purposes of potatoes. If he deals largely in that crop, it lessens the necessity of having this root; and ruta baga is as useful to hogs as the potatoe itself; but being far more uncertain, and the difficulty of securing a crop of it being greater, it cannot be depended on, like potatoes. The fly and drought, &c. are so fatal to it, that many farmers in Norfolk have sowed in vain for several years together.

PLANT POTATOES.

The end of April is the best season for planting potatoes, but it ought to be regulated by the finishing of other work, because this should be the last of the great spring operations of planting or sowing. When all others are done, then is the time to begin this. It will, some years, be in May: and I know several potatoe planters of great experience, and on an extensive scale, that prefer May to April for this work. That opinion, however, is far from general.

POTATOE CUTTINGS.

The first operation is that of cutting; slicing off the *eyes* of the potatoes, in which a good deal of attention is to be used; first, choosing from the potatoe heap only large and fair roots, rejecting all small ones, which should be thrown by for hogs, &c. There should be but one eye to a slice; but rather than have the slice a very small bit, two may be left in it, for sizeable slices are better, especially if a drought succeed, than small ones, as this plant, in this as well as in many other cases, in its first germination derives its nourishment from the *set*. These attentions are not stated as *essential* points, but as circumstances which will, in certain cases, have a degree of influence, which render them worth some portion of thought; and, in the long run, he who attends closely to every part of the business, and to all minutiæ, will on the average of soils, seasons, and manuring, get the best crops. Some planters, who value themselves much on their skill in this culture, prefer having the cuttings ready some time before planting, as they think a moderate keeping in that state beneficial. This point does not seem to be at all essential.

In the scarcity, *scoops*, for scooping out the eyes in semi-globular cuttings, were brought into use, to save the fleshy remains of the potatoes for common consumption. This practice was much condemned by some planters, and equally approved by others. From some experiments carefully made, the result of which I am well acquainted with, it appeared that these contradictory opinions might both be just, when founded on variations in practice. When the soil is sandy, or in a very light pulverized, or highly manured state, and every other requisite for success beneficially secured, these scooped cuttings succeeded just as well as larger sets; but when the soil was more stiff, unfavourable, in worse tilth, or not equally manured, or the sets ploughed in, under circumstances not very favourable, then the larger cuttings had a considerable superiority. The propriety, therefore, on any future occasion, of having recourse to this expedient, will depend on the state of the land, the soil, manuring, &c. If the cutting be done by the bushel, 2d. is a fair price, where women's labour is 8d. a day.

SORTS OF POTATOES.

They are endless, and fresh sorts coming every day into notice, till they give way to others in succession. It would be easy to name many sorts, but quite useless. The ox-noble was, for some years, the most productive for cattle and hogs, but I have known it to decline of late. It is, however, still preferable for largeness of product. The early Scot gives two crops a year for the table, but deserves no attention from the farmer for live-stock.

PREPARATION FOR POTATOES.

The best of all preparations is that of paring and burning, and then planting in the furrow of the succeeding ploughing, which should not be more than four inches deep. If 10 or 12 loads of long dung be spread over the ashes, and both ploughed in together, with Ducket's skim-coulter, it will add greatly to the crop.

PLANTING.

They should be set in every other furrow, which will make them come up in rows at 18 inches asunder. I plant in the same way when a stubble is dunged for the crop, or previous tillage given. I have had great crops by ridging the land in bout ridges of 26 to 30 inches, dunging the furrows, laying the sets on the dung, and reversing the ridge by a bout of the plough. All these ways will give good crops; and probably the Ilford method of dibbling in the sets may be as good, or better than any other, but it is much more expensive.

SEED.

It takes from 25 to 30 bushels, according to the size of the sets, to plant an acre promiscuously dibbled at ten inches, and from eight to ten to plant every other furrow, at one foot from set to set.

CARROTS.

If the carrot-seed was sown very early (earlier than they ought to have been) the crop will be ready for the first hand-hoeing by the end of this month. The rule is, to give it as soon as the young carrots can be distinguished from the surrounding weeds, and it should never be done in wet weather. The men must use four-inch hoes.

CABBAGES.

April is the season for planting the crop of autumn-sown cabbages. It is a work extremely easy to perform, and not at all expensive; but it is necessary to manage it in a judicious manner, so that it may be done to the best advantage. Just before planting, the land is to be ploughed from the ridges of the last earth. This earth should turn in the manure; then the ridges are to be harrowed, and one row of plants set along each ridge.

Women or boys should lead the way with the plants, and drop them, as nearly as they can, where they are to be planted: then the men follow with dibbles, and set them. The work goes off quickly, and is not expensive. Upon an average, it may be done in single rows, four feet asunder, for 4s. an acre, labour being at 1s. 6d. a day. It is proper to keep the men at work as long as they can see. The plants should be packed tight into baskets which are made for fitting into the carts.

DRILL CABBAGE-SEED.

The most certain and profitable culture of cabbages, is that of drilling them in April, where they are to remain. This system precludes the necessity of transplanting, which is at all seasons attended with some uncertainty, and in summer can only be performed in, or immediately after rain, and in case of a drought, must be postponed till a good a good crop may be unattainable. They should, in the drill system, follow some hoeing or cleansing crop, such as turnip, a previous crop of cabbages, potatoes, tares, beans or pease, &c. I suppose the land, in the case of its having yielded turnip or cabbage, to have been ploughed the moment the produce was consumed, into such ridges as are intended for the cabbage-seed, either three or four feet wide. If any of the other crops preceded, this ploughing should have been given before the Christmas frosts. Into the furrows of these ridges the dung, 30 cubical yards an acre, in no case less than 20, should be laid, in March, and the ridges reversed directly, covering up the manure and forming new ridges. They should then be left for 10, 12, or 16 days, to the influence of the atmosphere. In that state they lie sound and safe from rain. When it is intended to drill, harrowing should precede, or it may be omitted if the soil is very friable and in fine order, as the roller to which the drill is attached will level the crowns sufficiently, and they should not be reduced too much. The Northumberland drill is to be hung to a roller eight feet long for four feet ridges, or six feet long for three feet ones. Staples are in the frame of the roller for this purpose, and a chain hooks the drill to them. The roller covers the ridge drilling, and one in advance to be drilled by the next turn. So going on constantly, four pieces of a kitchen jack chain, about two feet long, attached to the drill, to be drawn after it in the centre, will cover the seed better than any other contrivance. The seed is deposited to the desired depth, by pressing on or weighting the drill. If it be half an inch deep it is sufficient. As soon as the plants appear distinctly above ground, if a surge of soot be drilled upon them, to the amount of 10 or 12 bushels an acre, it is a great security against the fly. One hopper and one round of Cook's cups, but larger, fixed to such a frame as that of the Northumberland drill, will effect it simply and cheaply. This is all that is necessary to be done in the month of April, and is the perfection of the cabbage husbandry.

WATER FURROWING.

This is a work that should be well performed on the new-sown lands, as soon as the tillage is finished. Very small savings in the omission of this work will be attended with certain and great losses.

TURNIP FALLOW.

The fields intended for turnips should be scuffled in this month, and should remain a short time in that state, and afterwards have harrowings enough to make all the seeds of weeds grow, that the tillage in the succeeding month may destroy them.

WOODS.

All work in woods should now be over, or damage will ensue from carting and from cattle. Good husbandmen will observe to keep their woods well fenced from cattle; the mischief they do being very great.

HEDGING.

This month must conclude the business of fences. It is bad husbandry to cut any hedges after April; nor have the plashes a good chance afterwards. They will not be so sure of growing; and nothing but a most uncommonly late season should permit any thing of that kind to be done now. All the faggot-wood arising from hedges should be brought home immediately.

CLEAR GRASS-FIELDS.

In the beginning of this month, particular attention must be paid to the clearing of the grass-lands from all rubbish that may affect the young grass, such as the cores of ant-hills, the sticks and bushes that are left after hedging, and whatever else may happen to be found that will obstruct the scythe. Mole-casts should be spread about with a spade and bush-harrow; and being composed of nothing but fine loose mould, they will do good to the grass. Keeping the meadows and pasture in a neat husband-like manner, requires attention of this sort.

ROLLING.

After the grass is cleared, in the manner mentioned in the last article, it should be rolled, to level it for the scythe. The roller must be of

weight

weight enough to level worm-casts, and crush mould. Some gentlemen are extremely fond of using very large and heavy rollers, thinking they are beneficial in proportion to their weight. This idea has been unjustly disputed. Another practice, founded on direct contrary principles, has begun to take place; that of scarifying grass with a plough consisting only of coulters, or harrow teeth. The advocates for this practice assert, that the burthen of hay (not the beauty of grass as a lawn) is much increased by loosening the surface, for the roots to have the power of a fresh vegetation: that the fault of most pastures is the being quite bound and hard; that rolling increases this tenacity, and is consequently pernicious. Experiments are mentioned, which prove that grass-lands are much improved by this operation of scarifying: and further, that its use is extremely great when the operation precedes manuring; as difficulty is found to get the manure below the surface, for the roots to feed on; whereas, if it be scarified well, the ground is opened so much, that whatever you spread on it gets at once to the roots; consequently a small quantity so applied, goes as far as a much larger laid on in the old way.

HOPS.

The chief business of this month, in the hop-ground, is that of poling. In an article of culture so extremely operose as that of hops, and which, at the same time, employs the largest capital of any branch of English husbandry, the only object which should be expected in a book of this sort, is slightly to touch on the chief works to be done, not by way of directing how all are to be performed; but as a mere aid to the memory to have the several works in mind, so that if a manager should happen to be careless, the master may be attentive to what ought to be going on. Thus, in poling there are several points which demand consideration, such as the quality of the soil, and the degree in which the last crop weakened the exuberance of the plants. If overpoled one year they are weakened, and must be underpoled the next. The time of picking, whether late or early, has also an influence. These are points which must be learnt by practice, and not by occasional observation, and they are named here, merely to call to them the attention of the young planter. The number of poles per hill vary from three to five. Their sort, size, length, and position, when set, are all of consequence.

FLAX.

Flax may yet be sown. The beginning of this month will do, though not so well as before.

It may be laid down as a general rule, that the land which is intended for flax should be brought to a very fine tilth by repeated ploughings, and that it should be enriched by a manure suited to the quality of the soil. On grass-land some other crops may be got off the land previous to flax, especially of such plants as do not occupy it long, and particularly of those which are remarkably benefited by frequent stirring of the earth whilst they grow; such as beans, pease, turnips, &c.; because these repeated stirrings render the mould fine and loose, and help to kill the weeds, which would otherwise do great damage to the flax. The Memoirs of the Society of Britanny inform us*, that the Livonians, when they clear wood-land, burn the wood upon it, then plough it, and prefer it in this state to any other kind of soil for flax.

If the land which is intended for flax be stiff, great care should be taken not to till it when it is wet, for fear of kneading it.

Most of our linseed is brought from the North. Linseed is reckoned good when it is large, oily, heavy, and of a bright brown colour. To know whether it be oily, a few grains of it are thrown into a red-hot fire-shovel, and they in that case crackle almost instantly, and blaze briskly. If it is sufficiently heavy, it will sink to the bottom of water; and to judge whether it be new, a number of seeds exactly counted should be sown on the end of a hot-bed, and notice taken whether they all grow.

Flax is sometimes damaged by insects, when it is about three or four inches high. It is said that they may be destroyed by a slight strewing of soot, ashes, &c.

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* Corps d'Observation de la Societé d'Agriculture de Commerce et des Arts, etablie par les Etats de Bretagne. An. 1759 et 1760, p. 186.

WATERED MEADOWS.

Throughout this month, if there are watered meadows on a farm, the use of them in supporting ewes and lambs is exceedingly great; but Mr. Wright is marked in his caution never to continue it longer, as it will greatly injure the quality of the succeeding crop of hay. Not, however, that there is any positive rule in feeding, as is evident from a case cited by that writer: "Having heard that the proprietor of an old floated meadow at South Cerney had disposed of the produce of it, in the year 1795, in a way that was well calculated to ascertain its real value, I wrote to a person who resides on the spot, requesting him to send me a particular account of the product, and I received the following statement. In order to make the most of the spring feed, the proprietor kept the grass untouched *till the 2d day of April*, from which time he lett it to the neighbouring farmers *to be eaten off in five weeks (which ran a week into May)* by the undermentioned stock, at the following rates per head: a sheep, 10d. per week; a cow, 3s. 6d.; a colt, 4s. The quantity of the land is eight acres.

107 wether sheep, one week,	£.4	9	2
8 cows, ditto,	1	8	0
4 colts, ditto,	0	16	0
	6	13	2
			5
For five weeks,	33	5	10
Three colts added for three weeks,	1	16	0
	8)35	1	10
Per acre, ..	£.4	7	8

The hay crop was, as usual, about 15 tons, and was five weeks in growing.

	£.35	1	10
15 tons, suppose 50s.	37	10	0
After-grass 15s.	6	0	0
	8)78	11	10
Total per acre, ..	£.9	16	5

The 4l. 7s. 8d. was made at a time when other grass-land is in a dormant state, or exhibits but feeble symptoms of vegetation. But the reader will perhaps see the advantages of this art in a still stronger light, when he is told that this meadow, which is now in the occupation of a miller, was a few years ago in the hands of a farmer, who, being at variance with the miller, was entirely deprived of the use of the water for a whole winter, which unfortunately was succeeded by a very dry spring and summer; of course, the spring feed was lost; and the whole hay crop of eight acres was only three tons."

POULTRY.

POULTRY.

This is a very busy month with the poultry maid. The young broods, especially of turkies, demand such careful and almost constant attention, that if they are numerous, the servant to whom they are entrusted should have little else to do. This circumstance renders it necessary either to breed a large number, that the expence may answer, or else to have no other than the common barn-door system.

BUILDING.

This is an article of rural economy which generally belongs to landlords or their stewards; but as a young farmer may possess his farm by purchase or inheritance, it is highly necessary that he should be cautioned in certain points, wherein it is probable he will have had no experience; and these may be noted without any encroachment into the bounds of works properly architectural. If he entered to his farm at the more common season of Michaelmas, he could not begin any buildings that require the work of masonry till April, but he should not longer delay it, for there is no point in building more necessary to be attended to, than that of finishing as early in summer as possible, that all works in mortar may have much time to dry before winter. If the house the farmer lives in be a very bad one, or which wants alterations and great repairs, it should be exceedingly well considered before they be undertaken, for thousands have thrown away so much money by beginning too soon, and without due reflection and foresight, that I shall suppose him to think steadily of it in some winter month, and not till he has resided in it a year, thoroughly to understand every convenience and inconvenience of the old one, before he thinks of going to work. But the farm-yard and offices, if they must be done, rank with other profitable improvements, that cannot (by those who have money ready) be done too soon. At present, I shall lay down such general observations on each office, and on their general connexion forming the farm-yard, as he may himself easily apply to his own particular case.

1. The thrashing-mill. The most important object, perhaps, which is answered by this machine, is that of saving barns, which are so very expensive in forming a new farm. I begin with it, as its position determines that of almost every other building in the farmery. There is not the smallest doubt of the propriety or profit of having one of these machines fixed in the principal farm-yard. If the farm be large, and stacks consequently scattered over various fields of it, then it may be right to have a moveable one also; but so many operations are wanting at home, that one should certainly be fixed. I have, in four plates, in the *Annals of Agriculture*, vol. xxxiii. p. 488, explained the relative position of the stacks to be built, on standings on wheels moving in a circular iron rail-way, so contrived that a very few horses

(four sufficient for any common stack) will draw each stack to the mill. This contrivance is essential, as it saves the whole expence of carting the corn, as well as the necessity of waiting for fine days to do it in; and as the expence is moderate, I cannot suppose that any person will now go to the heavy charge of barns and capt-stone standings, when less money will give him much greater conveniences. The circular form of the rail-way on which the stacks are brought to the mill, is necessary, as being the only one which permits a choice of any particular stack to thrash, without waiting for all or many others being done, before it can be got at; but a straight line leading to and past the mill is admissible, except for this circumstance, though inferior in some other points to the circular form. But whatever plan may be chosen, the mill should have the granary above it, to hoist up the corn as thrashed. It must also have the chaff-house annexed, as the power of the mill must cut into chaff all straw which is used in feeding cattle; and as hay is used in this operation, mixed with the straw, this decides the position of at least some hay-stacks. Close to and connected to the mill, must be a shed on posts, roofed to draw one stack under, before the thatch is stripped, and from which the corn is delivered at once to the mill. It is turned (so much as is wanted for chaff) into a straw-room, and the rest replaced on the standing of the stack that was last cleared, and being stacked on it with some care, is ready to be drawn away in the circle for litter. This circumstance decides the position of the sheds for cattle and horses, as they should be so placed as to be very near this litter. Thus situated, they demand hay also in their immediate vicinity, and as hay was also wanted for chaff, all the stacks would be within the circle. Thus far every thing is connected, and each building so placed, that it cannot be supposed in any other place, without a manifest inconvenience following. If milch cows be in the circle, which they ought to be, this article demands another combination of the dairy and the piggery, which must also be connected, but at a due distance from each other. I have, in the plans above alluded to, supposed the circle of cattle and team sheds to open on the outer side, to bring in the cattle, and to void the dung into a circular repository that surrounds all the sheds. A late writer has disapproved of this, and proposed to have the sheds to open within the circle; but this, I conceive to be very erroneous. The beasts must for this purpose be reversed; their heads to the outside, and the dung voided within the circle. This completely deranges the whole design, and converts much convenience into a most inconvenient arrangement. The chaff, hay, &c. must be conveyed *without* the circle to the heads of the beasts, by a long walk, instead of the nearest line; the dung must be within the area, cutting off all connexion with it; dirt and litter will be found where cleanliness should prevail; and nothing gained in return but a little better shelter,

supposing the sheds to be open; but as the contrary is supposed, this object would not be varied; so that I must adhere to the original proposal, as very much superior in convenience to the alteration thus indicated. Farm-yards, &c. have been executed by the great at an immense expence, which are not to be compared to this circular system, which might be executed for one tenth of the cost; and let the young farmer remember, that the combination for convenience is as applicable to the roughest and cheapest mode of execution, as it is to works of brick and slate, and ornament. Fir-posts, with a covering of stubble or fern, may be thus disposed, as well as columns of stone and mangers of copper.

The dairy should be situated within a certain reach of that part of the circular shed assigned to the cows, suppose 30 yards, and a slight foot-bridge thrown over the dung-pit, from the centre of the cow-standings. In contriving the dairy, there are a few points which should be attended to. The entrance into the milk-room should be through the scalding-house, and the copper for heating water, &c. should be in a shed without the scalding-house, that the heat may be as far as possible from the milk. The boiling water should pass by a cock in the bottom of the copper, through a trough or pipe, across the scalding-house (another cock being there in the pipe for washing smaller implements) through the wall into the milk leads, that whenever the dairy is free from milk, &c. or without being free in winter, the water may pass at once through the whole system of leads or trays, and be kept standing at pleasure in any of them, which is the most effective way of scalding, and having made the tour of all, may pass out to a drain. The immediate passage of the water through the wall of the dairy, should be in a trough large enough to receive securely a pail of milk emptied by it, that all from the cows may run at once through a hair sieve in this trough, into as many trays as are requisite to receive it. This prevents all ingress to the dairy by dirty men and boys who may bring pails of milk to it. The dairy itself may be circular, and if expence is not regarded, a fountain of water may play in summer in the centre of it, the water falling in a circular *jet*, surrounded by a clean gutter to convey it away. This, however, is mentioned as a hint for expensive dairies, and not by any means as *necessary*.

The establishment of a piggery demands even more attention than that of a dairy, combining as it does with more objects. This must be in a circle*, or it must fail in convenience. In the centre,

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* Circles of masonary are more expensive than straight lines: in this case, therefore, the round form may be broken into angles, so as to approach it; it may be in ten or twelve divisions, or less, as an

tre, the boiling or steaming-house, with a granary for corn, meal, bran, &c. a range of cisterns in divisions around it, for receiving immediately from the copper or steam apparatus, and also by tubes from the granary; around these a path, then the fence, wall, or paling, in which the troughs with hanging lids, for supplying food directly from the cisterns, on one side, and for the hogs feeding on the other; a range of yards next, and another of low sheds beyond, and last of all, the receptacle for the dung. The potatoe stores (pyes as they are called) should at one end, point near to the entrance, and water must be raised to the coppers and cisterns at once by a pump: a trough or other conveyance from the dairy to the cisterns, for milk, whey, &c. Such an arrangement will be very convenient, and the expence need not be considerable. To annex a certain space of grass, or artificial grasses, in divisions, into which the hogs may be let at pleasure, is an addition of admirable use, if the spot permit it. Those who do not possess a convenient pig apparatus, can have little idea of the great use of it, in making manure. This alone becomes an object that would justify any good farmer in going to a certain expence, for attaining so profitable a part of what ought to be his farm-yard system. In nine-tenths of the farmeries in the kingdom, it is lamentable to see so many parts

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an octagon; but where masonry is not employed the objection does not hold.

of a right piggery scattered and unconnected, in such a manner as to preclude convenience, increase labour, and prevent the making of dung.

In 1765 I built a hoggery, nearly, but not exactly on this idea, the expences of which were,

The boiling-house,	£. 18	18	0
Copper,	13	0	0
Pond,	4	0	0
Pump,	1	10	0
Cisterns,	14	0	0
Shed,	6	15	0
Paling,	7	7	0
Paving,	10	0	0
Troughs,	3	0	0
Total, besides timber,	£. 78	10	0

By means of one of these yards, I fattened 88 hogs in spring 1766, with only one man to attend them; whereas three would not have been sufficient without such conveniences. They were littered with nine loads of straw and haulm, that cost 6l. 18s. and this made 90 loads of very rich dung, valued by several farmers on the spot at 5s. a load.

Value of dung at that rate,	£. 23	10	0
Straw, &c.	6	18	0
	£. 16	12	0

But they had not half the litter they ought; they would have made 35l. worth of manure, beyond doubt.

Ninety loads costing 6l. 18s. is 1s. 6d. per load.

These particulars surely must prove the vast importance of such conveniences, for fattening great numbers of swine, for the mere purpose of raising manure. Suppose the expence, timber included, to be 110l. and the interest called 5l. what comparison is there between the expence of 5l. a year, and the prodigious utility of having it always in your power to fatten, with scarce any expence of labour, whatever number of hogs you please? With such a convenience, all the pease, beans, barley, buck-wheat, potatoes, parsnips, carrots, &c. that are, or can be raised on a farm, may be applied to the rearing, feeding, or fattening hogs; by which means the farmer has the opportunity of improving his land to the highest degree, and at the cheapest rate possible.

The total expence at present of such yards would not be less than 150l. And if made conformably to the more correct idea, would be 200l. or 250l. But the governing idea of position should be followed in sties of 20l.

The last circumstance of rural management that I should recommend to a proprietor, on his inheriting a farm, is that of building a house. He may, however, be in such a situation in respect of habitation, that to build a new house is more prudent than to submit to the very heavy repairs of an old one: and in other cases he may come to a farm without any house, it being let to a contiguous renter. In such cases, it will be useful to have some general hints for his direction.

It very rarely happens that a man has an opportunity of making the experiment of building a house twice in his life, and therefore he should reflect well before he begins. It is more common to see people fail in this essential step, than almost any other. How many new houses, in which people have no more elbow-room, in number of *pieces*, than if they were in the stocks! How many in which comfort is sacrificed to show, warmth to space, the sun's rays, in latitude 55, to the sight of a park or a lake, shelter to a prospect, and the convenience of a lumber-room to the arrangement of an anti-chamber! and as to cupboards, closets, and stowage of many sorts, the fools in middling life allow their puppy architects to sweep them all away; because my lord, with 40 servants, transfers such things to the offices. Where do we meet with a moderate house well calculated for a small fortune?—Where do you find one planned for a man who keeps the key of his wine-cellar; who has connected a kitchen and dining-room in such manner, that the smell of the former shall be excluded, without a long walk to the latter? Who has contrived a moving table, served through the wall, without any servants to wait in the room? There is not one apartment in a house, from the cellar to the garret, that has not been improved for men of large fortune; but, for small incomes, I believe invention has either gone retrograde, or at least stood still.

Circumstances for convenience, which should be attended to, in planning a house to be inhabited by a family whose income is small.

It is not necessary to define what the income may be, but only to mark it, by the points of the mistress being her own housekeeper, and the master keeping the keys of the wine-cellar; and that a general system of economy pervades the management, the proprietor farming his own estate, whether 400 or 1000 acres.

1st, The kitchen should not be a thoroughfare, nor any *house-door* open directly into it. The scullery as near it as possible, but without opening into it.

2d, The mistress's store-room should have a square opening into the kitchen (with a sliding door), on a level with the dresser or broad shelf which surrounds the whole store-room, through which she may give out whatever is wanted, without the necessity of her or her maids, &c. passing by a round-about way.

3d, The common *keeping-room* to open on one side into the store-room, and on the other, into a passage that leads directly to the wine and ale cellar, which should be near, in order that the eye may attend to what the hand need not perform.

4th, The window of the keeping-room to look full upon the grand avenue to the yards, barns, cattle, &c. and if possible, full (but at a safe distance), into the farm-yard.

5th, The farmer to have a store-room, as well as his wife, for sacks, small tools, nails, &c. &c.

6th, The farmer's bed-chamber, with a large window full to the East, that the sun may shine in early.

HEMP.

This crop is often sown in April, but in the more modern practice of the best cultivators, it has generally been deferred till May, probably from experiencing the evil of late spring frosts, when sown early. I shall therefore postpone the particular directions till the Calendar for that month.

SOWING GRASS-SEEDS.

Seedsmen are apt to mix seeds of nearly the same size, in order to have the fewer *casts*. This is a very bad way, and always to be guarded against. Five pounds of any clover, &c. cannot be divided and sown at two casts; but 10lb. may, and ought, and a larger quantity is better done at three; but for all small seeds, the Norfolk turnip-trough, which is now adapted to clover and ray-grass, is much the better way of delivering these seeds. Those of grass, which are light, ought never to be sown in a windy day; for an equal delivery is a point of great consequence. All grass-seeds should be covered at one tining of a very light pair of harrows. Of all other circumstances, sowing in the wet, so as to have the least degree of poaching or stickiness, should be avoided.

SEPARATED GRASS-SEEDS.

I cannot advise a young farmer to pay much attention to this object, unless he proceeds upon very sure grounds, by forming a contract for the sale of the seeds at a good price, before he commences his operations. I have myself gone largely into it, and have found it a cheaper method of procuring the seeds, to have them gathered by women and children, by hand, than to raise them myself, under the determination to have them perfectly clean from all mixture. However, as in certain situations, and under certain circumstances, it may become an object of attention, something should be said of it here.

This is the month for a spring sowing. There is no object in the whole range of cultivation, which demands land to be so perfectly clean as this, nor is any weed so mischievous, as a different sort of grass from that sown, nor any more likely to come. The seed must be sown in drills by hand, at one foot asunder, and from their first appearance above ground, kept absolutely clean. The year following that of sowing, they yield most seed, and presently decline in quantity. I have known several persons who have made the experiment, and who all gave it up. The sorts to be recommended are the meadow fescue, the poatrivialis, the crested dog's-tail, the meadow fox-tail, and the rough cock's-foot. Timothy is always to be had from America, and Yorkshire-white is in common sale. But for the farmer's own use, it is not so necessary to be so very nice, in which case, broadcast crops may be trusted to, for a mixture is no formidable circumstance. I have had the cock's-foot and the tall oat-grass gathered at 4s. a bushel, in large quantities; and the crested dog's-tail at 1s. a pound, and have thus laid down many scores of acres. At these prices I have found them cheaper than when raised in drills with great attention.

SIBERIAN MELILOT.

"The *Melilotus alba Sibyrica*, from Mons. Thouin, at the King's Garden, at Paris, makes, in the garden of Mons. Faujas de St. Fond, a most superb figure. Nobody can view its prodigious luxuriance, without commending the thought of cultivating it for cattle. The *coronilla varia* is a common plant here, and of such luxuriance, that it is hardly to be destroyed. The *hedysarum coronarium* does well here."—From this hint (which I extract from my own Travels), I introduced the culture of the melilot in my experiment-ground, and found it an object much deserving attention.

YELLOW-BLOSSOMED VETCH.

(Lathyrus pratensis.)

This is a very common plant in many pastures and meadows, and much deserves the attention of the experimental farmer. I have made various attempts to cultivate it, but not with the success I could wish; resulting, in a good measure, from the seed being attacked by an insect, which damages much of it. It does well by transplantation, but the method too expensive.

CORONILLA VARIA.

Another plant which we shall sometime or other see in common cultivation, and well merits a careful attention. It roots like couch, and is extremely difficult to destroy. I thought I had clean rooted up a bed of it, for transplantation into a larger piece of ground; but it came again the year following almost as luxuriant as ever.

ASTRAGALUS GLYCYPHYLLOS.

The experiment-ground of an attentive farmer should not be without this plant, which would pay well for a careful cultivation.

BUNIAS ORIENTALE.

I have had this plant in cultivation during four years, increasing the quantity as fast as I can: it is highly promising.

WELD.

In Norfolk this plant is sown with barley, in April, from one quarter to half a peck per acre of seed, in the manner of clover, and often with clover at the same time, which is fed or mown after the weld is pulled in the following year. This being a product sold to manufacturers, the price is not fixed in any manner very satisfactory to the farmer, and therefore I merely name it, that the reader may have it in his mind for trial, should he be so disposed. In other parts of the kingdom it is sown with turnips, which are fed off in the spring, and the weld left for a crop.

TARES IN CLOVER.

Very early in this month, and in some seasons in March, the young clovers should be carefully examined; for if the land has had this crop too often repeated, it is very apt to be what the farmers call *sick* of it. A full plant in autumn often dies away in winter and spring; so that by this month, the farmer, perhaps, is in doubt whether he shall let it stand or plough it up. In this case, it is highly advisable to dibble into all the vacant spots, spring tares, which thus take extremely well, and between clover and tares, a very ample crop is produced.

SOW FURZE.

Dr. Taylor, in Surrey, had a poor field of six acres, worth 7s. per acre, sown with furze, and thus converted to be the most profitable of the farm. It was sown (the land being cleared from couch) in April, 1782; mown in 1784, to thicken it; and cut for the first crop in 1786, and since regularly every two years, three acres per annum. Last year's cut of three acres produced 7700 faggots, and sold at 3l. 3s. per 1000, on the spot: this, 24l. 5s. 6d.; cutting and binding, 1s. 6d. per 100, or 5l. 15s. 6d.; clear, 18l. 10s. Suppose tithe, rates, and fences, to equal 5s., rent 7s., in all 12s.; or, for three acres, 1l. 16s.; that further charge deducted, net 16l. 14s.; or, per acre, 5l. 11s. 4d.; and, per acre per annum, 2l. 15s. 8d., which is a greater net profit than any man receives from wheat upon such land. Dr. Taylor thinks, that the product rather increases than diminishes. For the time of cutting, would recommend dry weather in February, or the beginning of March, when severe frosts are over.

MAY.

FARM-YARD.

ABOUT the twelfth of this month, the farmer may calculate that he will have a sufficient bite of grasses to leave off foddering entirely, and before that, he should not think of it; for if cattle are turned into grass not sufficiently advanced in growth, they will require such a number of acres, that his mowing ground will be greatly curtailed. As soon as the yards are cleared, if he is in the mixing system, the dung in them must be turned over, and mixed carefully with the stuff beneath, whether it be chalk, marl, turf, ditch-earth, or whatever sort. For this purpose, he must set many hands to work, so as to get it done as expeditiously as may be; because it should lay a little after turning, before it is carried on to the land. It thereby undergoes a fresh fermentation, and becomes more rotten. The method in which the men should do this work is, to begin and throw the dung up against a wall, or into some vacant space, so as to have the command of a trench to work in: they should always keep this trench three or four feet wide: then they draw down with dung-cromes the dung, and, breaking it to pieces with a fork, throw it up on the part already mixed, in a spreading manner, so as to cover all the chalk or earth. In this manner they proceed with the dung, to the breadth of about 18 inches, or two feet, till they come to the stuff under it; all which they pull down with pick-axes or mattocks, and, when it is in the trench, break it further to pieces, so as to have it fine; that is, no pieces larger than a man's wrist. If water hang in any places in their trench, they should have a water-bowl ready to throw it on the part they have mixed. If this work is well executed, he will have a large hill of excellent manure, ready to lay on to the cabbage or turnip land, to be turned in by the last earth.

Respecting the quantity—therein lies the proof of his being a good farmer; perhaps the most important, convincing proof, that a farm can offer. If he has managed well, he will have from 15 to 20 loads for every head of great cattle, and about 10 loads for every hog, not reckoning pigs; not above a third of the whole marl or earth. Every load of straw, trampled into dung, will make five or six cart ones of dung.

The earth which has lain under the dung all winter, and received the urine of the cattle, must by no means be reckoned as inferior to the dung itself. It is become a rich manure without mixing with dung, richer than the best of marls: and I am well persuaded, that this retention of the urine in it is of such consequence, that the whole compost, when well mixed together, will be better than if chalk or earth had not been brought into the yard, at least for most soils; but that the favourable circumstances of the conduct much exceeds the expence of it, for all soils, cannot be doubted.

A great recommendation of this farm-yard system is, the cheapness of thus manuring the land: the farmer will find, that he can, in no other method, manure at nearly so small an expence. Purchased manures come higher: many of them much more expensive, in proportion to their value.

In some situations, there are no manures of any sort to be purchased; in such, the farmers, if they do not adopt such a plan as I have mentioned, must give their land a poor chance; for it must be an admirable soil, or course of crops, to render manure unnecessary.

Thus far this article stands, as it did in the former editions of this work; but more modern experiments and observations have given birth to a different system, which must also be noticed here. The question of using yard-dung in a long or a rotten state, is a very interesting one, that merits both reflection and experiment. It has been remarked by several very able and attentive agriculturists, that long fresh dung is preferable to that which is short and rotten, from age or turning over. The observations which have been made in various parts of the kingdom, have attracted much attention, and the more so, as some chemical writers have from their theory drawn the same conclusion. The young farmer will act wisely to try both methods carefully, in order that he may have a degree of conviction which experiment alone can yield;

but such a trial demands particular attention, or it may deceive. Supposing two half acres marked out, they should be manured, the one with a certain portion of rotten dung, and the other with that portion of the same sort long, which the degree of freshness would demand in order to produce in rotting the quantity so carried in a rotten state: this cannot be prescribed, for it depends on the state of both dunghills at the moment. This is one way of trying it; but a still more accurate method is, to litter two sties, each of ten hogs fed equally, or two sheds of four fat bullocks, with a certain weight of trussed straw, and to use the dung of one fresh and of the other turned up and rotten; the experiment terminating at a time when the long dung can be used; the rotten may wait, but the long cannot.

Should the farmer determine on the older method, he turns and mixes his yard-dung as before described. If on the new way, he has nothing to do this month, but is to wait till he wants it for his turnip crop.

FEEDING OR MOWING GRASS-LAND.

As this is the usual season of turning cattle to grass, and consequently the time of determining what fields are to be fed, and what mown; our young farmer has some circumstances to attend to which may demand consideration. For instance, is alternate feeding and mowing better than to keep the scythe out of pastures, and the cattle out of mowing grounds?—Mr. Goring here offers a valuable remark:

"I do not even admit that grass-land should be mown and fed alternately: it is certainly the way to go on the longer without manure, and as certainly the way to ruin *(pari passu)* both fields in the end. In order to maintain its proper quantity of stock (we used to say) the land must be used to it; the more it keeps, the more it will keep; four this year, five the next: give it a little manure, more stock will follow, and so on till it has attained its *ne plus ultra*, if that point be to be attained. Land that has been used to the scythe will not *(cæteris paribus)* keep so much stock and so well as an old pasture, though it may have been better manured; neither will old pasture produce so much hay as the other; each will grow as it has been accustomed to grow; but the old pasture has an inherent sweetness in it, as well as virtue, which is hardly to be seen upon the ground, but is to be felt upon the rumps and sides of the ox: or to be discerned in the number of sheep which it maintains."

FIRST YEAR's MANAGEMENT OF NEW LAYS.

In this point there is a great difference of opinion. Some have contended that the new lay should be pastured by sheep; others by cattle; others mown for hay; others seeded.

In the North Riding, the best farmers feed their new lays with sheep the two first years.

If ray-grass and white clover be meant to remain some years, a gentleman in Strathern, of superior knowledge, eats them the first year with sheep: by this they are rendered thick, close, and durable.

To let heavy cattle in the first year, does mischief which demands years to recover—says another person.

If mown for hay, it should be cut early; for nothing is worse for new layers than the grass running to seed.

Mr. Wright, of Ranby, pastures them with beasts the first year, as sheep do harm.

Dr. Wilkinson compared sheep-feeding with mowing experimentally, and the superiority of the former was very great.

The Marquis of Rockingham seeded them the first year.

Colonel St. Leger fed the two first years with great success*.

I have practised all these methods; the last but one, merely for gaining the seed for other lands; and I have not the least doubt upon the question. If the grass be kept unfed in autumn, and it be not turned into too early in the spring, sheep do no harm, but much good: the number should not be so great, nor kept so long, as to allow the plants to be nibbled too close; but sheep-feeding is certainly the best for the first year. If bents rise, as they will do, let them be swept with a scythe before any of them seed, unless the plants be evidently too thin on the ground; in that case, the seed falling may do more good by raising fresh plants, than harm to those which yield the seed.

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* Though I have little doubt that feeding is the right management, yet it is not to be concluded that, with mowing, the grass will not succeed: Lord Rockingham's new lays, viewed in the autumn of the first year, were among the finest that have been seen; they were manured, however, the autumn after sowing, which is admirable management, provided the soil is sound, and the season very dry.

But it is not only the first year that sheep-feeding is the best management for a new lay; it should be so fed also the second year; and if the third, so much the better: there is no *necessity* for continuing it longer: but I have had some fields which succeeded well in feeding four, five, and even six years; and in general it may be laid down as a rule, that the more the land is sheep-fed, the more it will be improved, and especially if it is ever to be ploughed again for corn. But when sheep-feeding *enclosures* are mentioned, it is understood that the sheep are not folded from such fields: a ruinous, impoverishing, unnecessary system, of which the farmers are too fond, as they are of every way of robbing grass to favour corn.

CATTLE IN GRASS.

When cattle, whether cows, fatting beasts, or young stock, are turned out to grass, it is requisite to consider the best method of feeding. There are two opinions on this point directly contrary to each other: first, it is asserted by one set of graziers, that, let the grass to be fed consist of ever so many acres, that the cattle should have it all at once: if it is divided into eight or ten fields, the gates of all to be set open, for the stock to feed where they like. Secondly, the other set advance, that large fields of fifty, eighty, or an hundred acres, should be divided, that the farmer may change his stock from one to the other, and give the grass fresh and fresh. And each of these parties assert, that they know themselves to be right from experience. But that is impossible; one must, undoubtedly, be wrong. Let us consider the point from reason: it is one that will never be decided *fairly* from experiment; for two pieces of grass, each of eighty or an hundred acres, contiguous and *perfectly* alike, are not to be met with in the king's dominions; and, if they were, two sets of stock exactly similar, would not be found. The divisions into fields by hedges and ditches, for the purposes of draining and shelter, is not the inquiry, the comparison not being fair; as such divisions may be fed at once, by setting all the gates open, as well as one field. The inquiry is, whether the cattle will spoil the grass more in one way than in the other? and whether the grass will go as far in one as in the other, by fatting or feeding the beasts as well? The argument of giving the grass fresh and fresh, appears to be rather vague; for it supposes that the cattle will not eat it fresh, if they have the whole range at once, which may be a mistake: they will not be seen in the evening where they were feeding in the morning, but vary their food in the manner most agreeable to themselves; and we may in general observe, that the sagacious animals, when left to their own conduct, manage such points better than we can for them. As to the treading and spoiling, it is an equal objection to both methods; the legs of the beasts are not tied in small closes any more than in large ones. In case all the smaller pieces have not water, the objections to feeding them separate are much greater.

On the other hand, it must be admitted that there are disadvantages attending this way of pasturing: for a time the trampling may be greater, as cattle are disposed to beat a sort of march around their fields on first turning in, and also on some kinds of disturbance: but a greater evil is that of disturbing a large herd instead of a small one: this a dog may effect in one enclosure unseen from others, and consequently the stock in them left without interruption; and, perhaps, a motive greater than this is, its having been observed that cattle, and sheep also, do better when well proportioned to their pasture, when divided into small lots rather than large ones.

In the stocking grass-lands, the farmer should attend well to the proportion between his stock and the quantity of his feed. Let him remember when he stocks his grounds, that he should be pretty nice in this proportion; for if he overstocks, his loss will be certain and great; and, if he does not throw in as many cattle as he ought, then he will suffer by a waste of food.

There are several systems in fattening: to buy in beasts in October or November, and put them to straw till the end of February; then to begin their fatting on turnips, and continue it in March; thence to the middle of May on other food, and then to turn to grass, and kill in August or September. Another scheme is, to buy in smaller beasts in May lean, and sell them fat from the grass in the October and November following. Where winter food is raised with spirit, and the farmer takes a proper care to provide great plenty of litter to turn into dung, the first method is much the most profitable; but, where either of these requisites are wanting, the latter is preferable.

A third system is, to buy at that period which will, according to the size of the cattle, admit their being ready for market in April and May, when meat is generally sure of a good price; one winter not highly fed: a summer's grass, and a second winter driven on by the best feeding. This for large oxen; if smaller, to be bought in in spring, and have only a summer's grass and a winter's stalling.

CAKE AND CORN-FED BEASTS.

Our young farmer, if he has any cake or corn-fed beasts, not fat enough to go off the end of April, or the beginning of May, is under no necessity of parting with them, as they do very well on good grass though taken from oil-cake: I have known, in Lincolnshire, cake in a moderate allowance to be given while the beasts were at grass, and to go on very rapidly while thus fed.

BUCK-WHEAT.

This may be sown towards the end of the month. So late a time has offered the opportunity of good tillage to destroy weeds, and of course the land is fine, and in good order. It is a profitable crop, and especially on all (except very heavy soils) land that either requires late sowing, or that you are disappointed in the design of sowing soon enough to barley. Late-sown crops of the latter grain seldom pay expences: in such cases, it is useful to substitute buck-wheat; for I do not think that there are many soils on which a crop of buck-wheat, sown in May, will not exceed in value a crop of barley sown in May: yet in many tracts of country, it is a common custom to sow barley so late as that season.

LUCERN.

This plant may yet be sown: being a perennial, and, when well cultivated, yielding an immense profit, too much attention cannot be given to lay the seed in the ground with all possible advantages; that is, the land should be very rich and fine, perfectly free from weeds: these requisites a man may not be able to procure in April. In such case let him not sow in April, but wait till May; and this, whether drilled or sown broad-cast: if the latter, let it by all means be sown with buck-wheat, which is preferable to sowing it alone.

The advantages of cultivating lucern are so extremely great, that the young agriculturist should determine at all events, to have sufficient at the least for the summer support of all his teams and other horses; and if in addition to this quantity, he provides also for thus feeding much other stock in his farm-yard, he will find it a most profitable practice. The proper soil depends principally on two qualities, that it be quite dry, and very rich. If near the stables and yard, the convenience will be much the greater; but to choose the best land on the farm is, upon the whole, the best direction he can have. Those who at present cultivate it on the largest scale in Kent, Sussex, and Hampshire, where are to be found large quantities of it, very generally have it in the broad-cast mode, and as far as positive practice goes, this method must be preferred; but as effective cleaning it, and especially from indigenous grasses, is an object of great consequence, executed when broad-cast by a powerful and heavy harrow, it much deserves attention, whether drilling very straight at nine inches equi-distant would not be a preferable method. Drilling has been tried by many, and abandoned for random sowing; but nineteen twentieths of the drilled lucern which I have seen, have been at 18 inches, two feet, and some even at three; the consequence of which has been, a heavy expence and trouble in reaping instead of mowing; and, if these spaces are kept truly clean, the lucern being damaged by the pulverized earth adhering to it, and carried to the racks. If drilled at nine inches, it might once a year be most effectively horse-hoed with Cook's scarifiers in the iron beam, which would eradicate grass far better than any harrowing that could be given to a broad-cast crop, without a formidable expence, and some danger of damaging the crop, tough as the roots are. The grand object in the preparation of the ground is, to have it as free from weeds, and especially grass, as skill and perseverance can effect. The crop of the preceding year should have been turnips fed on the land by sheep, before the Christmas frosts; the field immediately ploughed, and laid by that ploughing ready for broad-casting or drilling. In March it may have been scuffled on the surface, and at the end of the month, or perhaps better, the beginning of April in a dry time, sown. This may be done with or without corn; if drilled, it will be better alone; if broad-cast with barley or oats, under-seeded: but it may be drilled with corn; the corn first broad-cast, and then the lucern drilled among it; or the corn may be drilled in one direction, and the lucern afterwards across it. Not less than 12lb. an acre should be drilled, and 20lb. sown broad-cast. It is apt to be eaten by the fly, &c.; if it escape that damage, all is safe, and the farmer may be assured that his care will be well repaid. No manuring at this period is necessary: but to sow soot just as the young lucern is got above ground, may be beneficial against the fly. In regard to proportioning the quantity of land thus occupied to the stock intended to be fed on it; a quarter of an acre per head is sufficient for all sorts of large cattle, taken one with another, if the land is very rich and good: but on more moderate soils, half an acre per head will be a proper allowance. It is much better to have too much than too little.

SAINFOIN.

This grass may be sown with buck-wheat with success, if the soil be proper; for hay, in countries where natural meadows and pastures are scarce, sainfoin is so valuable, that this culture should be attended to more than it is. It is a common notion, that sainfoin will thrive only on limestone lands or chalky soils. This idea excludes very extensive tracts in many parts of the kingdom, where sainfoin would be a valuable acquisition; but it is much to be regretted, that we should not experimentally know the exact soils on which it will and will not thrive.

BURNET.

This grass may be sown in May with buck-wheat, with as great a propriety as at any other season.

CARROTS.

The carrot crop should be hand-hoed this month: they may be harrowed before hoeing. The harrowing will not damage the young carrots, nor pull up one in twenty; but it will displace some weeds, and check the growth of many. The hand-hoeing should be performed with nine-inch hoes;

and they should set out the plants to the distance of twelve inches from each other. Gardeners do not let them stand further than eight or nine inches asunder; but when the roots are designed to be of a large size, that is too little: the crop will, in very good land, measure more bushels at a larger distance. These observations are equally applicable to parsnips.

POTATOES.

Some time during May, the early planted potatoe crop will require a hand-hoeing, which should be done with great attention, that not a weed may be left, and the surface of the land well cut, and in fine order. Crops in rows should receive, besides this hand-hoeing, the first horse-hoeing, which should be given with a common swing-plough, drawn by two horses, one before another, and turn a furrow *from* the rows, throwing up a small ridge in the middle of each interval. These operations should be well and attentively performed; for the weeds grow at a great rate, and, without such an attention, will destroy, or at least greatly damage the crop.

PLANT POTATOES.

This root may be planted throughout May; indeed many planters consider this as the best time for that business. They are a tender vegetable, and apt to have the green shoots cut off by late spring frosts. I have more than once had them turned quite black by frosts even in June. Deferring it thus late, is also a means of lessening the work of a farm in those very busy months, March and April.

CABBAGES.

The crop of cabbages planted in April will require a hand-hoeing this month. It should be given only to the tops of the ridges, about eight or nine inches around the plants: the weeds should be cut up clean, and loose moulds drawn to the stems of the plants. In about ten days after, the first horse-hoeing should be given, turning a furrow from the plants, and throwing up a ridge of earth in the middle of each interval. This operation will be of great use: it lets the atmosphere into the ridges on which the plants stand, and consequently sweetens and ameliorates the soil; and it kills the weeds that grow on the sides of the ridges much cheaper than it can be done by the hand-hoe; it likewise pulverizes the earth taken away, and brings it into fine order for returning to the plants in June, when they will strike into it, and thrive the more.

The land designed to be planted in June, should this month receive an earth to throw it on to whatever sized ridges you intend to plant on. This must not be omitted; because the beginning of the next month may be taken up in carting the manure.

DRILL CABBAGE-SEED.

The common culture of this plant, every one knows, is that of sowing the seed on a seed-bed, and transplanting where to remain; but a much superior method was that practised by the late Mr. Bakewell, of drilling the seed at once the beginning of this month where the crop was to remain. This saves the expence of transplanting; but that is an object of very small consideration, compared with the much superior point of certainty; and being secure against those droughts in June, which sometimes delay the planting so long, that a full, or nearly a full crop, is unattainable. I have often remarked how exceedingly superior plants have been, that were singled out in nursery-beds, and left without moving, when compared with others drawn out and transplanted. It is true, there is one object in which this system is inferior to the common practice; from February to June is gained for the fallow in the usual culture; but not *equally* in this new method. It is therefore to be recommended, not to practise it on foul land; but, in fields tolerably clean, it may be safely executed: however, perfect safety is attained if the cabbages follow some other fallow crop, as turnips, tares, beans, &c. The seed should be drilled in the Northumberland way for turnips on ridges, upon good land, four feet broad, and upon inferior soils, three feet: the manure being laid in the furrows, and the ridges reversed for covering it. This is a very profitable application of dung, which should be taken long and fresh from the yards, not less than twenty cubical yards, but thirty, or thirty-five, better, per acre, measured before stirring.

When the plants are four inches high, thin them by hand-hoeing, with a view to a second hoeing, that shall leave them at the intended distance at which they are to remain, 18 or 24 inches, according to the soil.

SOW SWEDISH TURNIP.

The ruta baga, or Swedish turnip, has, in a various experience, and through several of our counties, proved one of the most important acquisitions which the husbandry of this country has made for many years. I cultivated it upon its first introduction, successfully, at Bradfield, in the transplanting method: sowing the seed in a nursery or seed-bed the end of February, and transplanting it on the first rains in June; but my success was not so great as to induce me to be anxious about it; and for many years we heard but little of the plant. In 1801 I surveyed the county of Hertford for the Board of Agriculture, and was much pleased to find that this plant was so well established in that county, as to be almost common husbandry.

In 1802 I surveyed Norfolk, and there found that many of the principal farmers had made pretty large experiments on it, and been sufficiently successful *in some fields*, to have an high opinion of the plant; but many of them complained that the fly made such ravages among their plants, that they had no dependence on ever being able to secure a crop. The fact is, that the best culture of this plant is, to sow it where it is to remain, broad-cast, from the 10th of May to the end of the month; and of all others, the best preparation to secure a crop, is that of paring and burning; for the fly being the grand enemy, from its coming so very slowly to the hoe, this operation not only proves by far the best preservative against that enemy, but also pushes the plants on in an accelerated vegetation, and thereby doubly secures the crop. If the seed cannot be thus prepared, the next best management is, to sow it after common turnips fed on the land by sheep. If neither method suits, it must be put in on well-pulverized soil, very amply manured.

The inducements to the farmer to enter freely on this culture, are many and important. 1. If he has the right stock of seed, the root yellow in flesh and rough in coat, it lasts through all frosts, and may be depended on for sheep quite through the month of April, though drawn two months before, and spread on a grass field. 2. It is an excellent and nourishing food for sheep, and also for any sort of cattle. 3. It is equal to potatoes, in keeping *stock* swine; a point of great consequence. 4. It is, next to carrots, the best food that can be given to horses. 5. It is sown at a season which leaves ample time, in case of a failure, to put in common turnips or cabbages. All these are powerful inducements to urge a farmer to enter readily on the culture.

Bring the field into just such order as is requisite for a turnip crop, and sow two pounds of the seed per acre; one pound is enough, but if the fly is apprehended, it is much safer not to spare seed.

MADDER.

The crop planted last month will want a hand-hoeing before the expiration of this month: that work should be done with eight-inch hoes, and very carefully; for the young plants will not bear rough treatment of any kind, being of a most brittle nature. It will not be advisable to horse-hoe yet.

LIQUORICE.

The young crop of liquorice must be hand-hoed in May, and carefully hand-weeded at the same time. In common management, this is not well done, owing to the cropping the ground the first year with onions or carrots, both which, or any other plant, are but so many weeds, that rob the principal produce.

WHEAT FALLOW.

If the farmer fallows for wheat, which is, howeuer, but an unprofitable practice, according to the modern ideas of husbandry, the land should receive an earth this month, to turn in the weeds that have arisen since the last. The maxim of making the fallows very fine in April, to destroy the weeds by a ploughing in May, or the beginning of June, is in general good; for how, are they to be killed, if they do not vegetate? If the fallows are left rough in the common manner, the seeds of weeds are shut up in the clods: they are broken by the time the wheat-seed is sown: must not the consequence be, their growing among the wheat? But it has been urged, that on rich clays this practice would not be proper, on account of such spring tillage as I have described, cutting in numerous pieces the root-weeds, every bit of which grows; consequently, you would do as much mischief in one instance as good in another; but, being turned up very rough in large clods, the sun bakes them, and completely kills the roots. It is absurd to reason against experience; therefore, if a farmer tries the spring tillage, and finds, contrary to expectation, that it fills his lands with pernicious weeds, instead of killing them, he certainly should desist. But many persons know, from experience, that such management has destroyed seed-weeds, and proved no impediment to the destruction of root ones, by successive attention through the burning parts of the summer; not by leaving the roots in possession of large clods, but by extracting them. This is the case with the grasses, which are among the worst. Docks, indeed, can be no way destroyed, but by letting them grow, and then digging them up, and carrying them clear away from the land.

It should, however, be admitted (and it is a grand objection to summer-fallows), that if the summer proves wet, root-weeds will not be destroyed, whatever the system of tillage may be: that of clods will no more kill them than any other method, except picking them up by women, &c. following every machine by which the tillage may be given.

HOE WHITE CORN.

Wheat, barley, and oats, that are drilled wide enough for horse-hoeing, must be well attended to through this month, as all should be now finished, and early in it: the rows well hand-hoed and weeded at the same time, by the men stooping down to pluck out such with their fingers as they cannot get away with their hoes, without damage to the crop.

HOE BEANS.

The rows of beans will demand great attention throughout this month: the shims must work the intervals well, and the rows must be hand-hoed and weeded; at present the plants are not advanced enough to offer any difficulties, and all operations may, consequently, be performed effectually. If it is a wet season, interruptions will happen, for all hoeing is then very badly done, but no dry time should be lost; it may, from succeeding bad weather, be invaluable.

HOE PEASE.

This crop cannot be managed so well and so easily as beans; if in double rows, with wider intervals, in order for the tendrils to join and form one row, leaving a better space for hoeing, no proper season should be lost in cleaning. Crops dibbled close may demand a weeding.

SHEEP.

I suppose the spring food has lasted till the 10th or 12th of May; then they are to be turned into their summer's grass, in which they are to be managed according to the nature of the stock. *If* the flock consists of lean-stock sheep, whose profit is lamb and wool, then the business throughout the year, on whatever food, is to keep them in good and healthy order: these flocks are proper for farms on poor soils, and belonging to which are extensive commons, wastes, or sheep-walks: such tracts will only keep the sheep.

Another management in enclosed countries is, to buy ewes in August or September, to turn them on to the fallows, or the poorest grass on a farm, till Christmas, and then to begin to give them some turnips or cabbages, keeping them in good heart through their lambing, and afterwards as well as possible, that the lambs may be drawn fat by the butcher, soon enough to get the ewes fat and gone by September or October. This is a profitable practice.

A third system of conducting sheep is, to buy in two or three-year old wethers in the beginning of this month; to keep them rather bare till about three weeks after the hay is cleared, then to give them good keeping by degrees, and from it put them to turnips or cabbages to fatten, &c. contrived so as not to be sold till March or April, during which season they sell better than at any time in the year. This is a good sheep management, and will pay the farmer well.

Whatever the stock is, this is the time for turning them from spring to summer food. In the distribution of it, you should attend to the distinction between those sorts of cattle that do well on clover, and such as require natural pastures. Sheep, hogs, young cattle, and horses, are fed to more profit on clover than in pastures; but fatting beasts, large working oxen, and cows that are milked, are in more want of natural grass. It is true, butter and cheese are in many places made from clover; but then we do not know whether the prices are not lower. If clover is good, it will carry five, six, seven, or eight sheep an acre, and on some lands even more. Good grass will carry a cow to an acre; but it must be above the common run. However, in proportioning the stock to the grass, take care to be rather under than over; because it is an easy matter to mow a few acres for hay, in case you have too much; but cattle cannot be sold half fat, without loss.

In an enclosed farm there is one point which should be particularly attended to, and that is, the division of the flock into different parcels for all the fields intended to be fed. Bakewell, who was a great enemy to folding, and, in this respect, for many years little attended to, because it was imagined that his opinion was founded on his own breed being ill adapted to the practice—gave as one material reason for his opinion, that it forced a farmer to keep too many sheep in one parcel. He contended, that the waste of food, from this circumstance, was great, and that the sheep would never be kept as healthy and thriving in large as in small parcels. For many years I tried this system of division with all the attention I was master of, and am well persuaded that he was right in his opinion; and that it is impossible to keep as many sheep upon any farm in one flock as in 10 or 20. The farmer knows nearly what number each field will carry, and they ought to be distributed accordingly, with the precaution of having a pen at one corner, in order for examining them daily when the fly is abroad. Here if they are left, with no other changing than drawing off a few, or adding, according to extremes of season, they will do well, whether fattening, or ewes and lambs; and afterwards I minuted the following note:—"I continue of opinion, that the quantity of stock I am enabled to keep, depends much on the practice of dividing the flock into small parcels, and leaving them quiet in their respective fields, without folding; and that if they were in one parcel, and folded, they would on this breadth of land be starved. I cannot but urge gentlemen on enclosed farms, to make some experiments on this great question, in order to ascertain the loss they sustain in the number of sheep they keep, by adhering to the practice of folding; of the benefit of which, for corn, there is no doubt; but the price paid for that benefit ought to be better understood than I find it. Vague ideas have been long the guide of numbers: it is high time that on such essential points, positive experiment should alone be attended to."

CLOSE FEEDING.

In the distribution of sheep there is another point which demands attention, which is the benefit of close feeding. Here I shall insert a minute which was made on a year's feeding with attention.

" The next circumstance I would wish to note, is that of close feeding. In the preceding trials there was not, through the 30 weeks, scarcely a bent to be seen; the pasturage was constantly shorn to the ground; and in that state it was remarkable to see how constantly, and even rapidly, it sprung, during the continuance of a drought that was destructive of all produce in fields on the same farm, suffered to run to bent, for hay or other views. The comparison was the most decisive that can be imagined. I had many fields, better than any here registered, that yielded so contemptible a produce of hay, as to be scarcely worth mowing; and I was amazed to see in some of them how poor the *rouen* or after-grass was, so that both united, or the entire growth of at least 40 weeks, has amounted not to the fourth of the value of the produce of similar soils pared close by sheep. "A Romney-Marsh grazier would be ruined if he had so much grass on his land," says Mr. Boys, in his Farming Tour, speaking of a field understocked*. "Nothing so bad," says another, "in Romney-Marsh, as mowing, so that some landlords prohibit it." Pliny knew this—*Est enim in primis inutile, nasci herbas sementaturus*†. Of the fact, however, I have not the least doubt, from various experiments and observations; and there is no man but has remarked it in the case of ray-grass, the produce of which is lost, if the bent be allowed to rise. In all plants cultivated for pasturage, there is a great effort the moment the seed-stem runs; to which the whole growth of the plant is directed to form the seed; till then the growth is in the leaves; it is therefore palpable, that the way to have the greatest abundance of leaf, is by feeding so close as to prevent those stems rising at all. And I may further observe, that on this system of feeding, those grasses which yield a very great, but coarse produce, become sweet, fine, and valuable, by thus keeping them close fed. The *avena elatior*, or tall oat-grass, is very coarse, but in a field of 13 acres and a half of that grass, it never was suffered to rise, and consequently was found on examination as fine and pleasing to the eye as any of the more delicate grasses. It is with this view that I am cultivating it largely, and also the *dactylus glomeratus*; and both are remarkably early.

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* Annals, vol. xix. p 118. See also Mr. Price's Observations, in that Marsh.

† Plin. Hist. Nat. lib. xviii. cap. 28.

It is an inquiry that deserves attention, whether the superior profit of grazing sheep, on comparison with oxen, does not depend very much on this point of close feeding; for large cattle the herbage must be kept to a good head, to give a full bite, and consequently innumerable seed-stems form, which tend to reduce the produce greatly.

FOLDING SHEEP.

This month begins the folding season throughout England; and the practice is (when relied on) of such importance, that it should be steadily pursued. Many farmers give a very slight dressing: one night in a place, and the fold three square yards per sheep; instead of which it should be two nights, and only two square yards, or but one yard. In a word, the land should be quite black, if arable; and with a pretty good covering, if grass. The proper arable lands to fold this month are the cabbage and turnip fallows: those crops will be sown and planted in June, consequently will reap the benefit of the manure directly. All this on the supposition that the openness or other circumstances of the farm demand folding.

The practice of a very intelligent Kentish farmer here deserves notice :—" The circumstance which perhaps most deserves attention in Mr. Boys's farm, is that of dividing his flock: instead of keeping his sheep in one flock, he keeps four, and is at the constant expense of three or four shepherds, rather than suffer many to be kept together : he is so clear of the profit of this conduct, that he would not for a moment admit that any question could be made of it : the lambs suffer, the food is wasted, and the whole flock the worse in proportion to its size: of this he was clear to the most perfect conviction."

SALT FOR SHEEP.

I shall at another season note the circumstance of giving salt to sheep particularly ; at present it ought to be observed, that the practice is proper for summer as well as for winter. It is remarkable, that this custom should be common management in almost every country in the world, England alone excepted. It certainly tends to keep any flock healthy ; and is necessary in proportion to the soil, food, &c. being ill adapted to them ; and also to the wetness of the season.

HOGS.

When the farm-yards are cleared of cattle, the hogs should be sorted, and all those of a proper age for feeding on clover, &c. should be drawn and turned into it. This is a part of farming that has been much expatiated on; but is not yet common husbandry every where. It well deserves to be considered.

In the old management of swine, they were kept at home, about the farm-house, or a close of grass, all summer, with times of regular feeding on wash, grains, or corn; but the error of such a conduct, was making no distinction between sows with pigs, or weaned pigs, and large hogs. In the more modern method, all the wash, &c. is reserved for the former: consequently a much larger stock can be kept; and the hogs, half, and three-fourths grown, are turned into the clover or chicory about the middle of this month; and it is directed, that the gates of the fields be locked on them, and kept there till towards Michaelmas: but for this conduct the fences must all be in excellent repair, and a pond in the field for the hogs to drink at. This food agrees well with them; they grow fast, and are taken out of either clover or chicory in good order for fatting. This practice must certainly be attended with beneficial effects: enabling the farmer to keep larger breeding stocks of hogs, is alone of much consequence, and cannot fail of improving his profit: swine will pay for their food as well as any other application of it; and the consequence of the whole system, in raising large quanties of excellent manure, cannot be too strongly insisted on.

As the dairy will this month afford great plenty of butter-milk and cheese-whey, all that is not wanted for the present stock of sows and pigs, should be reserved in brick cisterns, so contrived, that it may run without loss directly from the dairy: this will be worth many pounds per annum in a farm of any size: where such contrivances are unknown, the wash must all be used as fast as it is made, and whether wanted or not; which is a greater loss than many persons, not used to the improved practice, will easily imagine.

SOILING HOGS.

The preceding system is good, but I prefer soiling them in their yards, notwithstanding the expence is much increased, and that some food will be wasted. The inducement to this practice is the immense quantity of valuable manure which may be raised in this manner. Our farmer should not however attempt it, if he be not well provided with litter of some sort or other, including in that term sand and peat. The hog-yards should have gates wide enough to admit carts for bringing these materials and food in, and for moving away the dung. Lucern, chicory, clover, and tares, are the proper food for this system.

HORSES.

This month the farmer should leave off dry meat for his horses. He should soil them in the stable on lucern, and if he has not lucern, on tares, or clover, or chicory. This is one of the most important articles in his business; he should, therefore,

fore, consider it well, that he may adhere to that practice which most reduces the expence of keeping the team.

Food given in the stable goes much farther than in the field, and also enables the farmer to raise large quantities of dung throughout the summer. These are both objects of great consequence; and if he appropriates a small field of lucern, near the stable, to this use, he will find it by far the cheapest way of keeping his horses. An acre, perfectly well managed on rich good land, and amply manured, will maintain four or five horses from May to October; but if a farmer would manage in the most judicious manner, he should allot an acre to every two or three horses; by which means he will be sure to have plenty to spare for any other use.

This system of conducting the team cannot be too strongly recommended; those farmers who provide grass or clover to turn their horses into, know well the great quantity of land that must be assigned them, and the high expences in general of keeping horses: they should determine to embrace all methods of lowering such great expences, and none offers more clearly, and with a greater certainty, than the cultivation of lucern for summer food.

MARES TO HORSE.

Mares should not be permitted to have the horse later than the end of this month: they go eleven calendar months. April is a better time for them.

OXEN.

Ox-teams are maintained in winter at a much less expence than horses; but in summer they are nearer an equality: the same reasoning is therefore applicable to both. It is as advisable to soil oxen on lucern as horses: they will thrive extremely well on it, and at a much less expence than pasturing them in the common manner.

COWS.

In this month, the cows should be kept in good food, that the dairy or the calves may return the farmer a due product. Clover, and ray-grass that has been fed off early with sheep, will suit them well; but if the clover should, as it is commonly imagined to do, give the butter a taste, the variation of price should then be calculated, on comparison with the convenience the farmer finds in feeding with that grass. Lucern does excellently for cows, and gives the butter no ill taste: it will, mown and given in racks or cribs, go much farther than food eaten in the field, and at the same time yield an opportunity of raising much dung: a point that ought never to be forgotten. If this method is pursued, care must be taken that the feeding-places are kept well littered. In this manner the dairy or calves will not fail of proving extremely profitable. It is not at all necessary to assert, that the cows will yield as large a produce in this manner, as when turned into natural grass up to their horns; that is by no means the inquiry; but there cannot be a doubt of their yielding a much greater profit, which is the only point of consequence. In natural grass, they will eat, spoil, and trample a great breadth; in exceeding good grass, an acre a head at least; but if your lucern is good, one acre will feed three or four cows amply. Such a state of the case, at once shews that the *product* of the cows has little to do in the inquiry: it is the *clear profit* alone that should be considered.

In the feeding of horses, oxen, or cows, with lucern, let me observe, that it should be regularly mown every day; and the best way of carrying it to the stable, will be in a small skeleton-cart drawn by one horse, and made for the purpose. In the cutting it, the plantation should be marked into forty or fifty divisions, according to its growth; one to be mown every day, and the cattle so proportioned, that they may eat it regularly. This will save trouble, and make the proportion between the cattle and their food to be discovered with the greater accuracy; the lucern, if well managed, and on good land, may be cut four times.

THE DAIRY.

Now the business of the dairy is in full operation: this is one of the most ticklish parts of the farmer's business. Unless he has a very diligent and industrious wife, who sees minutely to her dairy, or a most honest, diligent, and careful house-keeper to do it for him, he will assuredly lose money by his dairy: trusted to common servants, it will not pay charges. The dairy-maid must be up every morning by four o'clock, or she will be backward in her business. At five, the cows must be milked, and there must be milkers enough to finish by six. The same rule must be observed in the evening. Cleanliness is the great point in a dairy: the utensils should all be scalded every day, and cold water should be poured down on the floor in hot weather, a cock of water running constantly through it: falling on the floor, and dashing a good deal about, would have effect in cooling the air. The fountain recommended in another month, better still. There is scarcely any part of a farm that wants contrivance more than a dairy: if the number of cows be great, well-contrived conveniences would save much expence of labour, and pay a farmer for erecting them himself.

Mr. Abdy, in his account of the Epping dairies, remarks, that their farmers buy pigs at four or five months old (which, in 1788, cost 18s. each), keep them on skimmed milk for about a month, and sell them with 6s. profit. The general proportion, one to every three cows in milk; and as the cows (the long-horned Derby breed) in general stand to the pail for nine months, this will make three pigs fatted from the milk of each. The average quantity of butter made by each cow, per week, is 4 lb. of 16 oz. and the whole, therefore, of each cow 156 lb.

156lb. at 10d. ..	£.6	10	0	at 1s. 3d.	£.9	15	0
Calf, ...	0	18	0		1	5	0
Pigs, ...	0	18	0		1	10	0
	£.8	6	0		£.12	10	0

The age of cows when most in use, after the second, third, and fourth calf. When the hay is a large productive crop on the ground, the cows eat more, and the milk is not so rich as when the quantity on the ground is less. The dairy-maids are peculiarly attentive to one circumstance, that there must be a certain proportion of *sour* in the cream, either natural or artificial, or they cannot ensure a good churning of butter; some keep a little of the old cream for that purpose; others use a little rennet; and some a little lemon-juice. When the butter is come, the dairy-woman throws it first into clear water, and then on to a board, and with her hand in each situation, squeezes the butter-milk out, and when on the board, sprinkles a very little salt over the whole mass (for one of the properties of Epping butter is, to have very little salt in it); the lump is then divided into pounds, and as they are weighed, are thrown into fresh water; when they are all weighed they are again squeezed and rolled on the board with the hand till they are about 14 inches long. This is the whole process.

In Suffolk it has been found that four gallons and a half of milk give one quart of cream: which quart gives one pint of butter, which weighs 1¼lb.

THE METHOD OF MAKING BUTTER IN HOLLAND,

BY MR. R. P. CAREW.

Having milked the cow, the milk is not put into pans till it is quite cold. It is then stirred two or three times a day with a wooden spoon, to prevent the cream from separating from the milk; and if it can be stirred until the spoon will almost stand in it, it is deemed so much the better. When it is found to be sufficiently thick, it is put into the *churn*, and beat for an hour. When the butter begins to form, a pint or more of cold water, according to the quantity of the milk, is poured in, to separate the butter from the milk.

When the butter is taken out of the churn, it is washed and kneaded till the last water is *perfectly clear* and free from milk. By this method, a greater quantity of butter is made from an equal quantity of milk. The butter is firmer and sweeter. It will keep longer than that which is made in the ordinary mode which is in use in England, and the butter-milk is thought preferable.

N. B. A churn is thought better adapted to the purpose than a barrel.

Butter and Milk in Cheshire.—" There does not appear any thing particularly worthy of notice in the process of making butter, unless it be the common practice of churning the ' whole milk,' instead of setting up the milk for the cream to rise, and churning it alone, as is the custom in most other parts of the kingdom. In Cheshire, the whole milk (viz. cream and all, without being skimmed)

skimmed) is churned together; and preparatory to that, the meal is immediately, after milking in summer, cooled in quantities proportioned to the heat of the weather, previous to its being put together, which from time to time is done in earthen 'cream mugs,' or jars. In these jars (containing four or six gallons each) it is intended to stand till it is 'cawed' (as the term is), or clotted in a proper degree for churning, and this is judged to be the case sufficient for the intended purpose, as soon as the whole is coagulated, and has acquired a small degree of acidity, which will generally take place, in warm weather, in the course of a day or two. In winter, the cream mugs are placed near a fire, to forward the 'cawing,' or clotting of the milk. If the milk, in warm weather, has not been sufficiently cooled before it is put to the former meal, or if, in winter, the mugs have been set too near the fire, it curdles the whole mass, making it (as the phrase is) 'go all to whig and whey,' and afterwards heave in the mug. Again, if in summer, or when kept in a warm situation, the milk is not churned within a day, or a little more, after it is sufficiently 'cawed,' a kind of fermentation and heaving also ensues: in both cases the butter will be rank and ill-tasted; nor will the milk produce so much butter, as when it has been properly managed, and churned in proper time. We do not find that any comparative experiments have in this part of the country been made, so as to ascertain with any degree of certainty, which of the two common modes of obtaining butter is the best, in regard to quantity, flavour, &c. This matter, however well worth attending to, might easily be ascertained by experiments, both simple and unexpensive. In most parts of Cheshire butter is made up for sale in lumps, that have the term 'dishes' applied to them: the weight of a 'dish' is one pound and a half, or 24 ounces.

"The churns in common use are of the upright kind, and have, in some instances, a lever applied to them: when that is the case, one end of the lever (which is supported by an upright frame) is connected to the end of the churn-staff; the other end of the lever, by means of a rod, is connected to a crank in a toothed wheel, and this is worked by a pinion fixed upon the axis of a common winch. By means of this contrivance, the business of churning is performed by one person with the greatest ease."—*Wedge.*

CHESHIRE CHEESE.

"The general mode of making cheeses is from 50lb. to 60lb. weight each, and which now sell, from good dairies, at from 43s. to 55s. per 120lb. and upwards. The process of making Cheshire cheese is as follows, viz. on a farm capable of keeping 25 cows, a cheese of about 60lb. weight may be daily made in the months of May, June, and July. The evening's milk is kept untouched until next morning, when the cream is taken off, and put to warm in a brass pan, heated with boiling water; then one-third part of that milk is heated in the same manner, so as to bring it to the heat of new milk from the cow. (*Note.*—This part of the business is done by a person who does not assist in milking the cows during that time). Let the cows be milked early in the morning, then the morning's new milk, and the night's milk, thus prepared, are put into a large tub, together with the cream; then a portion of rennet, that has been put into water milk-warm the evening before, is put into the tub, sufficient to coagulate the milk; and at the same time, if arnotta be used to colour the cheese, a small quantity, as requisite for colouring (or a marigold or carrot infusion), is rubbed very fine, and mixed with the milk, by stirring all together, then covering it up warm, it is to stand about half an hour, or until coagulated; at which time it is first turned over with a bowl, to separate the whey from the curds, and broken soon after with the hand and bowl into very small particles: the whey being separated by standing some time, is taken from the curd, which sinks to the bottom; the curd is then collected into a part of the tub, which has a slip or loose board to cross the diameter of the bottom of it, for the sole use of separating them, and a board is placed thereon, with weights from 60lb. to 120lb. to press out the whey; when it is getting into a more solid consistence, it is cut and turned over in slices for several times, to extract out all the whey, and then weighed as before; which operations may take up

"By a pretty-accurate calculation, in the upper vale of Gloucester, I found that a cheese weighing somewhat more than 11 lb. (namely, at 10 to the cwt.) took about 15 gallons of milk (ale measure) or one gallon and one-third to 1 lb. of *two meal cheese*. From two instances, minuted with tolerable accuracy in this district, the proportion appears to be in one instance somewhat more, and in the other somewhat less, than 1 lb. of curd to one gallon of new milk.

"The season of making. 'Thin cheese' is made from April to November; but the principal season for making 'thick cheeses' is during the months of May, June, and the beginning of July. If made late in the summer, they do not acquire a sufficient degree of firmness to be marketable the ensuing spring.

"The rennet made use of at Frocester was prepared in this manner: to two gallons of water, made salt enough to bear an egg, add one pennyworth of mace, one pennyworth of cloves, a handful of sweet-briar and hawthorn buds, a small quantity of alum (about the bulk of a small walnut), the same quantity of sal prunella, a small quantity of cochineal (a small *pinch*—the bulk of half a hazel nut), and, if to be had, two or three bay-leaves. Pound the alum, sal prunel, &c. and having mixed the several ingredients with the salt and water, add five vells, or if small, six or seven. In about ten days the rennet will be fit for use.

"Another recipe which I was favoured with in this vale, is the following: three handfuls of common salt to three quarts of water, a quarter of an ounce of salt-petre, and as much black pepper as will lie upon a shilling, a small quantity of agrimony, a sprig of sweet-scented thyme, a handful of sweet-briar, a handful of the red buds of hawthorn, four heads of sage. Add the ingredients, and boil the water a quarter of an hour. To the liquor, when cold, put one vell. The rennet may be used the next day."—*Marshall, Gloucester.*

◆

PARE AND BURN.

Paring and burning the turf, is in some places begun so soon as March; it holds all through May. In the burning, many hands should be set at work at once, that a dry time may be caught for it, in case the season in general proves wet. One peculiar circumstance attending the breaking up of grass-lands, whether old turf or sainfoin lays, is the bringing them in order for turnips with only one ploughing; and it is a general and very just observation, both in the north and west of England, where this husbandry is most common, that turnips scarcely ever are known to fail on burnt lands: the fly, on such, is nearly unknown. Now, any farmer must be sensible of the vast importance of thus bringing turf-land, by only one ploughing, to a turnip crop: much tillage is thus saved, as well as a great expence; and the turnips are generally a crop that repays the expences of the operation with profit. In a word, this husbandry deserves the warmest praise.

But of late years, an opinion against it has prevailed much in some counties. Several of the nobility and gentry, of very large estates, have interdicted the practice, not allowing their tenants to pare and burn under any pretence whatever. The reason assigned for this conduct, is an apprehension that the depth of the soil decreases from it: that you burn *the land*, and reduce half an inch to half a line; a great evil, when the land is perhaps only three or four inches deep on a limestone rock. But this reasoning, many very sensible and experienced farmers know to be false. They, on the contrary, urge the universal circumstance of no land ever being pared till it has acquired a turf, which, with natural grasses, will be from 7 to 20 years; and, with sainfoin, the duration of the crop, which is from 10 to 20 years: that it is not the *soil* which is burnt, but the bulbs of the plants, the roots, and net-work of grass-roots: the earth, which is intermixed, is not burnt: it is calcined, but not reduced to ashes, all of which arise from bulbs and roots: hence the fact, that the staple of the soil rarely suffers from paring and burning. If this reasoning be not true, whence the known fact, that soils not four inches thick, and which have remained at the same thickness as long as the oldest man can remember, have yet been pared and burnt regularly four or five times in a century; and, as the same husbandry is known by record to have been practised for ages on the same land, the staple must have lost three inches every hundred years; in other words, it must have been totally gone long ago, and nothing but rock remained: all which is evidently false, the soil at this day being as thick as ever. We may hence conclude, what such farmers assert to be true, that the earth suffers no diminution, those roots and bulbs only being reduced to ashes, which in breaking up by the plough alone, would rot away.

HOPS.

Dig the new-planted hop garden this month: earth up the plants, and see that no weeds are left to infest them. At this time you should also pole your old plantations, proportioning the poles to the age and growth of the hops. Within a short time after, the binds are tied to the poles. These are nice operations, and not to be detailed in a work of this sort.

BEES.

Watch well the apiary, for you must now expect the bees to swarm. This useful insect is not so much attended to by many farmers as it ought to be: not a farm-house should be without bee-hives; for the trouble they give is very trifling, and by farmers small profits should not be neglected: the union of them is not trifling.

HEMP.

As this is the season for sowing hemp, and it will now probably attract the attention of our young farmer, it is necessary to consider here the culture generally as well as particularly: first the inducement to enter into this husbandry; and secondly, if that be determined, the means of doing it.

As hemp is an article in which the farmer produces a raw commodity for the use of the manufacturer, he is liable to suffer if he does not move with caution in a country where it is not in the common husbandry of the vicinity: where his brethren produce this or any other commodity, the silent progress of competition, and the customs of trade, which gradually establish themselves, usually render it fair between the parties: and an article in which the profit went too largely to one party, in prejudice of another, would soon be given up. This situation is quite different from a young farmer attempting to introduce this or any other article in a district where they are not common; he is, in such, extremely liable to suffer in the sale of his product. Before, therefore, he ventures on any such articles as hemp, flax, woad, madder, &c. let him most carefully ascertain his market, and the variations the commodity is usually liable to; and, if he cannot contract for the sale, he should be cautious of engaging in the cultivation. It may be twenty to one whether he has any thing like an open market to carry his product to; and if he has not, he may find a crop on his hands, easily sold, but not perhaps at a fair price. The profit of cultivating hemp, *in hemp districts*, is not inconsiderable, amounting usually from 5l. to 7l. an acre, which, under certain circumstances, is an object worth attention; but here again he is to take into his account some other circumstances which demand attention.

It requires the very best land to be found on a farm, or which is made such by manuring: a rich deep, putrid, friable, sandy loam: and it cannot be too rich. It further demands ample manuring; that is, from twenty to thirty loads of dung per acre, equal to forty cubical yards by measure. It is true, that it will pay for this dung, but every one knows that in calculations there is apt to creep in (in the point of charging dung) some degree of fallacy. Wherever spread, there, probably, will be the greatest profit; and if hemp, hops, madder, &c. rob the more common crops of dung, which, but for their culture, would be disposed of otherwise, it is no easy matter to charge them for it sufficiently high. If hemp enters largely upon a farm (which it rarely does, and for this reason), the cabbages, potatoes, lucern, &c. must be contracted.

Another very material circumstance is, that hemp returns nothing to the farm wherewith to raise dung: corn gives straw, and green crops swell the dunghill; from hemp the farmer gets nothing of this sort.

Hence the husbandman that looks only to the profit on the estimate, however fairly it may be drawn up, will not have the subject before him in all its bearings; he must reflect well before he begins. If, upon the whole, he thinks the undertaking advisable, he will, in the next place, attend to the circumstances of the *culture.*

Soil.—This should be the richest on the farm; deep, moist, friable, putrid: if none of that description, any deep, good sandy loam, worth 30s. or 40s. an acre, should be applied. Mellow, rich clayey loams do well; and nothing better than old meadow-land, no matter what the soil, turned down by the skim-coultered plough.

Tillage.—There are many crops for which tillage should be cautiously given, as the weeds that may set a-growing will choak and get the better of various plants; but this is not the case with hemp, which is so predominant in its growth, that it kills all weeds. The land should, from the preceding autumn to the time of sowing, have three or four ploughings; or two, and sufficient scufflings, and be harrowed to a fine surface.

Manuring.—Dung should be amply applied, in proportion to the deficiency of the soil in fertility; but it is rarely ventured on any without a good dressing. And when the culture is continued on the same land (the most usual system for it), yet they commonly manure it every year if they can; from 16 to 50 cubical yards are given, according to the soil.

Seed.—The quantity varies according to the opinions of individuals, and the practice of different districts, from 11 to 14 pecks.

Sowing.—Universally broad-cast; nor can I see any motive for drilling a plant which utterly destroys weeds, except one, that of burying the seed at an equal depth. Should any person be inclined to drill, the rows should be as near to each other as the shares of the drill can be set.

COTTAGERS' HEMP.

It is an extraordinary circumstance, that by far the greatest part of the hemp that is raised in Europe, is by cottagers, or very little farmers: this is the case in the Ukraine, as well as in Suffolk. Here, as well as there, and in many other countries, it is sown every year on the same land by cottagers, who provide dung for it by keeping a cow, or some pigs. Whether it is the most beneficial culture in England for such a person, has been disputed; but when the benefit of manufacturing it themselves is taken into the consideration, and the advantageous winter employment it affords to the women and children, I have little doubt of its being the best crop they can attend to; or, of its yielding them much more neat profit than sufficient to buy any or all other products the same land could yield, if not thus employed.

FLAX.

FLAX.

This is another culture that requires extremely rich land. It answers pretty well with due attention; but I may remark on this crop what I did on hemp, that the same favourable circumstances of soil, manure, and weeding, would repay the farmer much better in other crops, with this general and great superiority: hemp and flax return no manure, whereas many other crops I propose are undoubtedly beneficial to the soil, and vastly improving to a whole farm, in the quantity of dung they enable the farmer to raise. Flax may be sown the end of April; but more commonly in May, as it is liable to be damaged by frosts.

It does best on grass-land for the first crop, but perfectly well wrought to a fine surface. Two bushels an acre the quantity of seed. It must be kept perfectly free from weeds.

SPRING TARES.

If the farmer depends on a succession of tares for soiling, or for feeding sheep, he must sow for one crop some time in this month; and better still twice, in case the April sowing was early in that month.

WATERED-MEADOWS.

The ewes and lambs are to be taken out of these meadows the last day of April, by which time it is supposed they are fed quite bare, and it should be remarked, that the barer they are fed so much the better. I have heard farmers express themselves well pleased at finding that their sheep had eaten almost into the ground, as they said the meadow would be the better, and the crop of hay of the finer quality: the observation is general for all spring-feeding. Immediately on clearing, Mr. Boswell directs a week's watering, with careful examination of every trench and drain; and the water shifted into other meadows in succession, alternately watering and draining; and lessening the time the water remains on the land, as the weather grows warmer, and in five, six, or seven weeks, they will be fit to mow for hay. But at Downampney, in Gloucestershire, they do not water at this season, as they say it is this summer flooding which alone causes the rot in sheep. To water, appears, notwithstanding, greatly preferable.

FORM NEW WATERED-MEADS.

In situations that possess plenty of water, with meadows for receiving it, they may be formed at any time in the year except in severe frosts; but when there is any doubt of the quantity of water being sufficient, the safer way (if any large expences are in contemplation) is to begin the work in a season when the undertaker is not liable to be much deceived: this *may* be the case in any month, if the preceding period has been remarkably wet: allowance must, however, be made for any such accidental circumstance; and it will be a good precaution not to lay out any large extent of meadow, till some experience has been had, that the quantity of water is sufficient for the meditated work. As this is (warping alone excepted) the greatest of all improvements, it is deserving of the greatest consideration and study of the water and land before a beginning is made. I should recommend, in the first instance, the employment of a professed irrigator, could the young farmer possess knowledge enough to ascertain the skill of such a man; but I have lately seen such gross blunders made in Norfolk by such an one, on the farms of four or five persons, and yet highly recommended, and coming from Gloucestershire, that I really think a man may just as well trust to himself, with the assistance of books, as to put any faith in men who are reputed skilful only in proportion to the ignorance of those who employ them. In the cases to which I allude, this ignorance was unpardonable; for as they discovered that he drew out all his works without the assistance of a spirit-level, they ought to have dismissed him. Not that such a man cannot make improvements; no one can well contrive to bring water on to land without improving it; but to pay 4l. or 5l. or perhaps much more, per acre, for using a small quantity of water to *some* advantage, when the same might be used elsewhere to *the greatest*, is, comparatively speaking, throwing money away. If the following observations are carefully attended to, they will, I trust, enable any man to operate for himself in most of the cases that can occur; and with a certain degree of sagacity, in all.

1st, The great benefit to be derived from power to take water from a river, or stream, or lake, &c. will much depend on taking the first level from the highest spot on the water to which the operator's property or farm extends. If he is a landlord, and has several farms on a stream, and some out of lease, others in lease, he must either wait till the leases are expired, or he must purchase of his tenants liberty to run his grand carrier through their farms (the property of the water retained to himself) wherever the level may point out.

2d, If the stream be any thing considerable, he may probably find water-mills the greatest impediment to his project, whether his own, if leased, or belonging to other landlords: he must make himself thoroughly acquainted with this circumstance, or, after having been at considerable expences, he may meet with a prohibition against taking the water, when he is just ready to open the sluices and set it a-flowing.

3d, If the river be the boundary of his property, and his neighbour on the other side has an equal right to the water with himself, he may be in the same predicament, and a deed of sale, or transfer, or permission, must be obtained before he begins, not possibly in the power of the person to grant. All this must be well understood before he commences his operations.

4th, If, in running his first and highest level, he meet with a field or fields not his property, which intervenes by elbowing into his estate, and cuts him off from much other land that belongs to him, he must buy such fields, or perhaps lose the greatest benefit which would result from his operations. If he cannot buy the fee-simple, can he buy permission to cut through it?—He must know this before he begins.

5th, Having given due attention to all these circumstances, let him repair with his spirit-level and attendant, to the highest spot where the stream enters his property or farm, where he has the property on both sides, and where he can erect works across the stream in order to divert the whole, or any part of the water into a new channel; and let him begin to take the level from the surface of the water, supposing it pent to the highest by such works.

6th, He is to level from that spot following the dead level, and at every three or four hundred yards, staking it out doubly, one stake on the dead level, and another near it, descending from the dead level, so many inches as an allowance to give the water a current: two inches in a mile will move it, but twelve to twenty should be allowed, in order that the current may be sufficient.

7th, Roads need not be any interruption, as they may be passed in a manner hereafter explained; but farm-houses, yards, gardens, cottages, &c. may intervene; and if they do, a much greater descent per mile must be allowed, that such interruptions may not be quite suddenly, but *gradually* provided for; as the former occasions inconveniences.

8th, In this manner let him proceed to the extent of his property, leaving stakes at all his stations, so firm in the ground, that they cannot be removed.

9th, If both sides the stream be his own farm or property, let him go back whence he started at his highest spot, and do exactly the same on the other side of the vale, staking out his level there also.

10th, Having proceeded thus far, let him view, and carefully examine all the land on both sides the river below his lines of levelling, for he has the power of watering all or any part of it, if the stream be sufficient. The breadth will depend on the degree of the declivity between his first and last station, and on the diverging and fall of the higher grounds or hills; but in every case he will find a vastly greater quantity of land than he had any conception of before he took the level. Mr. Bakewell lent his irrigator to a friend, in order to ascertain whether he could water the church-meadow; and on the level being taken, it proved that the water might be carried over the church-steeple, had the land been high enough to receive it. And at Euston, the seat of his Grace the Duke of Grafton, it having been a question in conversation, whether such and such lands could be watered, I took the levels for above five miles from Sappiston Mill, and found that the sand fox-covers, on pretty high hills near the Hall, might be converted to water-meadows.

11th, When the levels are taken, in examining all the lands below them, the main point (in which errors are perpetually made) is to determine where to begin. If there be water sufficient, all should certainly be done; but, supposing a choice necessary to make, whether from insufficiency of water to do the whole, or from any other cause, then the operator must exercise his judgment; and in making his estimation, he is to attend to the following circumstances:

1. The expence of digging his grand carriers on the levels first taken, which should be large enough to take *the whole stream* on either side the vale at pleasure; but if the lands on one side are more favourable for watering than on the other, let that carrier be executed first. If the most favourable land to work upon on such side, be at a great distance from the *prise d'eau*, or original spot where the water is first taken, and there be not water for the whole below the level on one side of the river, then he must compare the expence of the carrier with the superiority of the profit of watering the most favourable fields, rather than others nearer not offering in themselves an equal advantage. In most cases, the benefit of watering at pleasure is greater than the expence of making the carrier. And in this point there is also another consideration of great moment: though the river may not afford plenty of water in summer, or very dry years, yet it may abound in winter, and watering at that season alone is well worth the expence of all the

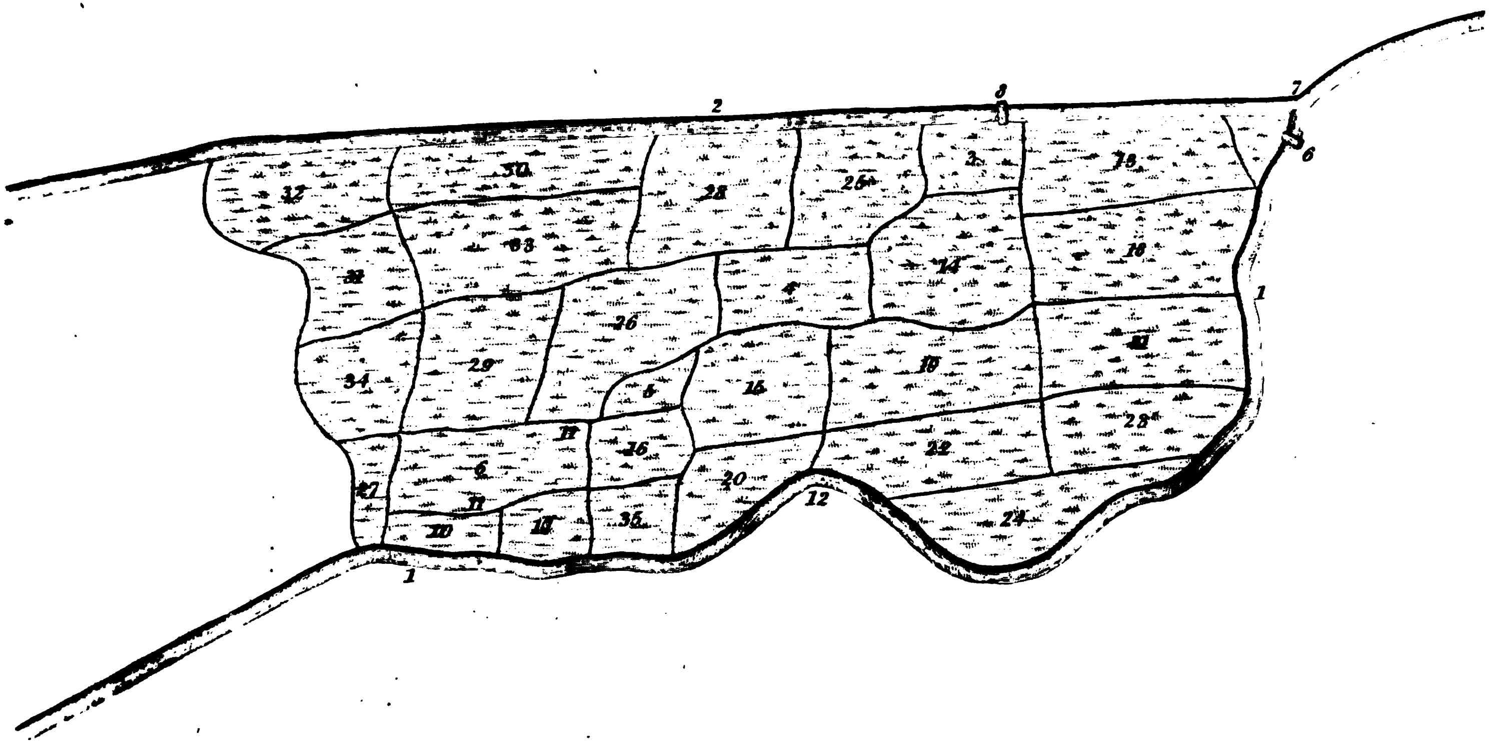
necessary works in most cases: and this consideration should influence him rather to extend his carrier, than, by shortening it, be forced to water fields not so well adapted as others at a greater distance: probably the winter watering may go on through the whole line.

2. When such a level is taken as I have described, there is often found below it a great variety of soils and circumstances; usually a low flat range of meadows, perhaps wet and boggy, by the side of the old river, and adjoining, and above them slopes of pasture, and arable, it may be dry, gravelly, sandy fields on various angles of declivity; bogs, ling moors, and in short, every sort of soil and land; so that the irrigator may choose what he pleases to work upon. Here he must be instructed, that the lands usually chosen for the first operations, are just those that ought to be the last, viz. the low flat meadows by the river. These are often improvable to a very high degree by draining and manuring with sand, gravel, earth, chalk, marl, &c.; but they are by far the most expensive to irrigate, and when done, unless very well executed indeed, yield the worst hay. They are best watered, and in many cases, only to be watered advantageously, by ploughing them into broad and highly arched ridges; the delivering trenches to be on their crowns, and the drains in their furrows. But the profit of irrigating dry slopes of sand and gravel, &c. and poor dry ling moors, is immense; the expence is comparatively

trifling, and the improvement beyond conception: such lands may be raised from 2s. or 3s. an acre, to 40s. or 50s., while the flat meadows may be 20s. before the undertaking begins, and may not, when ended, be worth more than the others, though effected at ten times the expence. I once found a friend in the full speculation of watering some meadows which were worth 25s. an acre, and just ready to set a man to work, who ought to have known better. I thought by my eye, that the water (the quantity very limited) might be better employed on some dry arable land above the meadows, but further down the vale. I took the levels, and found it as I conjectured: the plan was adopted, and I have since heard that the undertaking was remarkably profitable. The meadow at Six-mile Bridge, in Hampshire, which letts for above 5l. an acre (a gravel at 10s. before watering), was formed at little other expence than converting a ditch into a carrier; nor was the conduct of the water, when I saw it, correct by any means.

12th, In viewing therefore, the lands below the grand carrier, our operator should choose, for his first works, those fields, the soil or state, or value of which are the most promising for working a great improvement, and these will be the dry arable slopes, or poor dry pastures. And if he has a choice, let him begin with one which joins his carrier, and mark the lower spot, side or corner of it where the water may best have its issue, having been worked over its surface; and at that spot taking

IRRIGATION



taking his station, let him examine what field is so situated as to take the water next. If the declivity is at all steep, any may do; but if gentle, it may be necessary to conduct it diagonally to some distance, before a field is found low enough to receive it; for let our operator have it in his attention, that he is to conduct the water thus first taken till its final exit into the bed of the river, whence it can no more be taken by him, before he meddles with any other work. In some cases it might be more profitable immediately to water other fields nearer the carrier, but as the water used in the first field would in that case run to waste before it arrived at the river (especially if the tract to be watered be of any extent), and as it is beneficial to plan what is to be done with all water taken, in its whole course from the carrier to the river's bed, it is much better to finish with it before a fresh work is opened.

On gentle slopes of country this plan will generally make it necessary to conduct the water by a line of fields diagonally across the slope of the country. To illustrate this, reference may be had to the annexed Plate.

Here (1), is the river; (2), the grand carrier; (3), the field first watered; (4), the field watered after the first; (5 and 6), ditto, in succession; (7, 9) the *prise d'eau*; (8), a sluice to throw the water into the field where first used; (10), final exit of the water. But in this respect variations may be as many as the forms which a tract of country presents. (6), in this dragram, may be a good meadow already; in that case the water may run to waste in the ditch (11), and so find its way to the river. The main object in such a work as this Calendar, is not to give a treatise on irrigation, which would demand two such volumes, but only to bring to the operator's recollection certain points to which he ought to pay attention.

Having watered one range of fields diagonally across the space between the grand carrier and the river's bed, he may then return and work a second range, and so on till he has acquired a power of conducting the water to any field at pleasure; and by means of the ditches which intersect the space and form the divisions of the fields, he can miss any fields that are unprofitable on comparison with others, leaving them for future operations, when the quantity of water, and the effect of the irrigation, shall be better known. But while he thus has it in his power to pick and choose the fields for watering, still the whole is on one regular plan, by which he may at any time be able to execute all the parts, and render the whole, when finished, if it be advisable to finish it, perfect and uniform.

The divisions 13, 14, 15, 16, 17, form a diagonal system.

The others, 18, 19, and 20, another.

21 and 22, another.

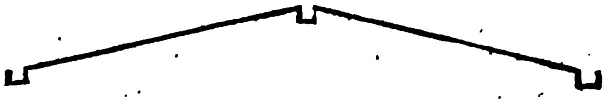
23 and 24, another.

25, 26, 27, another.

28 and 29, }
30 and 31, } others.

32 and 33, by themselves, the one from the carrier, the other from the ditch between it and 28.

13th, In regard to the respective operations to be performed in each field, it is necessary in such a work as this, merely to afford such general principles and hints as a man of any sagacity may apply to every distinct piece of ground when he views it. The grand principle which is to govern these works is, to bring water on as plentifully as may be, and let it run off quickly,—*nimbly*, in irrigating language: if it stagnates it does mischief, and if it only creeps sluggishly, much less good than a better course would have enabled it to effect. All spaces that are level, or nearly level, should be ploughed on to lands or ridges eleven yards wide, and raised, if water be plentiful, three feet higher on the crown than in the furrow, in this form,

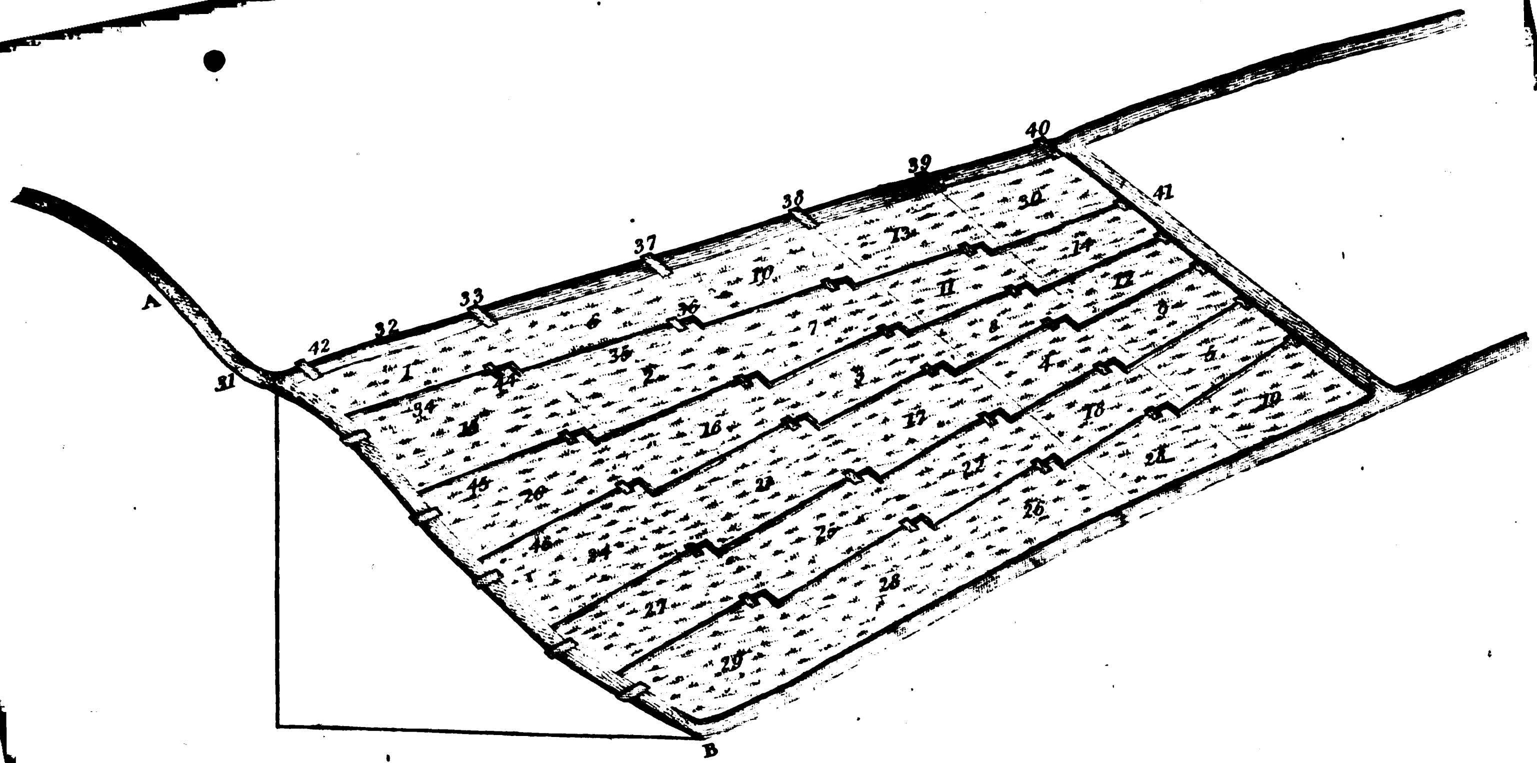


and, of course, these ridges must be laid out by the spirit-level, so that the delivering trenches on their crowns may be able to take water from the larger carriers which lead along one head-land; and that the furrow-drains may convey the water away to the receiving ditches provided for that purpose. Those trenches are to be so exactly cut, that they will overflow through the whole length equally at the same time, for which purpose they lessen in breadth as they advance. But upon dry slopes, nothing

thing more is requisite than to cut trenches of delivery, which operate by alternate watering, both as deliverers and as drains. This is a point little understood in watering through several districts I have seen, and as it is a very important one, and a branch of that diagonal system I have already explained with relation to the position of the fields, it merits a short explanation.

In the annexed Plate, the slope of the land from A to B, is supposed regular, which, of course, rarely happens in Nature, nor is it essential, as any man who has common sense will see that inequalities of surface, though they may break the uniformity of his lines, by causing a necessity of going round hills or holes, yet will make no breach in the principles which govern the irrigation.

Here, it appears, that if water from the main carrier, river, or ditch, 31, be let into the delivering trench, 32, and the stop, 33, be let down, the water will flow over the division of the meadow (or *pane*, as Mr. Boswell calls it) 1. The delivering trench, 34, then acts as a drain, and conducts the water into the trench, 35, the stop, 36, being let down; thence, of course, it overflows the pane No. 2, and in like manner, successively, No. 3, 4, and 5. If the stop, 33, be drawn up, and the stop, 37, let down, the panes 6, 7, 8, and 9, are watered in the same way; and so on by the stops 38 and 39, which will water the panes 10, 11 and 12; also 13 and 14: and the stop, 40, being let down, and 41 drawn up, the pane, 30, will be watered.


A
B

watered. The return to the ditch at the other end of the field, and letting down the stops, 42 and 43, it is evident that the water will flow into the trench 34, and the stop, 44, being down, the pane, 15, is watered, and the trench, 45, becomes a drain, which, successively, conducts the water, as above explained, over the panes 16, 17, 18 and 19. Now it is clear, that when the trench, 46, becomes supplied with water, and the trenches, 34 and 45, are empty, that the panes 1 and 15, are in a perfect state of drainage; and this may be sufficient to explain the system, and to shew how every trench operates, either for delivering or draining off the water, at the pleasure of the irrigator. And it should be noted, that this diagonal system enables him to use the smallest quantity of water, as well as the largest, for he can use it only through one system of panes, if necessary, or he can, with great plenty, flow all at the same moment till the meadow has enough, and then stop the whole out, and leave the trenches to operate only as drains, while the water is working in another meadow. It is not uncommon, for want of such a plan of operation, to see trenches of delivery accompanied by drains, which operate only as drains, and which carry away the water without any power of using it even a second time; and in other cases we see the water brought on to slopes without any thought of taking it away again, consequently some parts are much watered, some less, and some, perhaps, not at all.

14th, The application of this system to mountainous moors, is one of the most profitable speculations which agriculture has to offer, and yet there are none so much neglected.

From viewing them I have been greatly surprized at this, because there are scarcely any that do not contain such spontaneous proofs of the advantage, as might have been sufficient for a hint to the stupidest clown. The firm spots by the sides of the torrents, from flooding, acquire a beautiful verdure, that proves a perfect contrast to the dreariness of the waste around; and where there are little rills on the mountain sides, not considerable enough to cut a regular bed for their waters, but which spread, they are attended so universally with a verdure, from the grasses getting the better of the heath, owing simply to the water, as shews the advantage in the clearest manner. I am confident that, with a little attention, out of 20 or 30,000 acres on a range of mountains I have viewed in Ireland, water might be thrown over three parts in four. The declivities through which the streams run are considerable, and extensive tracts of land slope off on either side, so that by obstructing those streams, by piling torrent stones across them at various heights, and drawing small channels in the mountain sides, just above such obstructions, to receive the water, this most advantageous work might be done at small expence, and a single experiment of it would presently shew the prodigious advantage of the practice.

In case these papers should come into the hands of any possessors of mountain tracts, willing to try it, but not acquainted with the proper mode of executing the work, I shall here offer a few directions, not by way of going minutely into the whole business, but in order to put every man in such a train as to enable him by practice to instruct himself in the rest, and to carry it further than many books on the subject will teach.

The principle upon which he is to proceed, is to throw as much water as possible over the sides of the mountain, and as equally as possible; and in doing this, to guard against two circumstances: first, its remaining in any spots; and, secondly, his works being blown up by sudden floods, from heavy rains, which come in large tracts of mountain with an impetuosity incredible to those who are used to a flat country.

It would be right to begin, by choosing a place where the declivity of the mountain is gentle, in order that the space improved may be more useful and obvious than it can be when very steep: going up as high as the water can be conveniently commanded, make a weir of stone across a torrent, just high enough to form a little bason among the rocks, if there is none executed to your hand by nature: in the Galties you find these at every ten yards. At the spot where you have made, or found one of these basons, open a trench from it, a spirit-level shewing where to conduct it; taking care to give it no more fall than necessary to bring the water in a very gentle current. The stream is to be made to overflow out of this carrier-trench all the way it runs: the trench must be made gradually smaller to the end, as the body of water it brings lessens as it advances.

I would advise the proprietor to see the experience of a year or two, watering with no further expence than I have described (which is evidently too trifling to be an object). If he find the effect great, as in all probability he will, I should then advise his levelling the spaces over which he throws the water, to that exactness which is necessary for mowing ground: this, in many mountains, is the most expensive part of the business; for rains which drive down their sides, in almost universal torrents, work thousands of little channels round the tufts of heath, that are so deep and sharp, as every sportsman knows, who has been tired with walking, or rather tumbling over them: these must all be levelled, and the water let gently over, which will soon cover them with grasses, and other beneficial plants. The heath lives in its own acid water, that stagnates in the moss and peat, as in a dish, but will die away by being flooded in the manner I have described. The progress of the work will naturally arise from success; if the proprietor be attentive, he will find his success so great and obvious, as to be induced to go into the business with the utmost spirit. He will then level all inequalities, cut a variety of enclosures, and divide the declivities into fields by good and sufficient fences.

15th, Wherever irrigation is applied, it is right, when arable land is thus intended to be converted into meadow, or on any other land the surface of which is much broken by the works, to sow any sort of grass-seeds that can be procured in the greatest plenty, before the watering begins. It is well known that the water will of itself bring grasses, but it demands some time, and the benefit of sowing them is always found to be considerable.

16th, It is a common-practice in Lombardy, to have a sort of heavy harrow drawn along the bottom of the main carriers, in order to disturb the mud in autumnal, winter, and early spring irrigations; and it has been practised in England to throw lime in, the great divisibility of which body in water is well known: these are means of adding to the manuring quality of the water, very easily to be practised.

17th, To attempt describing the minutiæ of erecting weirs, sluices, stops, and to note how trenches or drains are dug, would be unnecessary. In Mr. Boswell's pamphlet on watered-meadows, a work of great merit, these particulars are detailed; and to him I refer for the necessary information.

18th, Wherever roads intervene, the Italian method is, to form a work of masonry to act as a syphon: the water is made to descend perpendicularly on one side the road in a tunnel of brick or stone, pass in an arch under the bed of the road, and rise on the other side in a similar tunnel, and then pass on its course. I have seen several of these between Coni and Turin, and in other parts of Lombardy.

SOILING.

This month being in general the period for turning out various sorts of live stock to grass or clover; it is now a question which demands the young farmer's very serious attention, whether he should comply with the more common custom of feeding off certain crops, or whether he should determine to pursue the soiling system of mowing, and giving them green in the stables, stalls, yards, &c. Considering the decisive superiority of the latter mode of consumption, there is not a fact in husbandry which ought to create so much surprize as the general custom, all over the kingdom, of feeding cows, young cattle, oxen, bullocks, &c. in the fields; and the almost general practice of managing the teams in the same way. Enlightened farmers have in many districts adopted this system for horses, but still reject it for cattle; and it will probably take a century to render it as universal as it might be, most profitably. The objections to it are not of any importance, even if started in the strongest manner: it has been argued that the expence is an object; and that cattle will not thrive so well, nor will cows give so much milk as if fed in the field. That the expence is something, cannot be denied, but that it amounts to any thing considerable, is contrary to fact. Mr. Mure fed 240 fatting oxen in sheds through a whole summer by the mowing of one scythe: if the attendance upon the beasts be added to this amount, the whole will evidently come to a sum which, when divided either per head or per acre, will be so low as to do entirely away this objection. As to the question of thriving, the assertion has been made, as far as it has come to my knowledge, without a trial, and is consequently mere theory. The beasts mentioned above, were all sold fat at Smithfield, and did as well as similar beasts had done fed abroad in the most favourable seasons, and better than in any summer not remarkably favourable. I practised it for several years together very carefully for fatting cattle, weighing alive periodically, both while in stalls and when at grass, and I found that in soiling they throve better than when abroad. If the world will reason upon every question of farming, they should do it without prejudice, and then their reason would, to my apprehension, agree with these facts. Every one knows how tormenting flies are to cattle when abroad: ride into a field in summer to look at stock, and where do you find them? Not feeding, but standing or resting under trees, in ponds, in rivers, and, if there is no better shelter, in ditches under brambles; in a word, any where but feeding in the open air.

what they graze is in the morning and evening; and in many cases they lose in the heat of the day all they gain at those moments of their comfort. To this superiority we must add that of the main object, which is the dunghill: in one case this is accumulated in a degree even superior to what is effected in winter; in the other it is scattered about the pastures, and nine-tenths of it carried away by the flies, or dried almost to a *caput mortuum* by the sun. The warmth of the season in summer promotes the fermentation in a mass, and speedily prepares it for use, in whatever state the farmer wishes to have it. The prodigious superiority of thus raising a large and very valuable dunghill in one case, and none at all in the other, ought to convince any reasonable man, that there is not a practice in husbandry so decidedly superior as this of soiling, were there not one other reason for it than what have already been produced.

Those farmers who have given particular attention to the state of farm-yard manure, as it is made in winter and in summer, and to the efficacy of both, can scarcely have failed to remark, that the superiority of the dung arising from any sort of stock, *commonly fed*, in summer, is very great to such as is made in winter from stock no better fed. The manure yielded by fat hogs, and by fat beasts fed on oil-cake, is of such a quality, that the season does not demand attention; but with all other stock I have great reason to believe, from many observations, that a farmer should make as large a reserve of straw-stubble, &c. for littering in summer, as possible.

Cattle, when soiled upon any kind of good food, as tares, clover, chicory, lucern, or grass, make so large a quantity of urine as to demand the greatest quantity of litter: the degree of this moisture in which their litter is kept, while the weather is hot, much assists a rapid fermentation, and great quantities of carbonic acid and hydrogen are generated. The winter's cold, with superfluous water, by rain or snow, has a contrary tendency; the manure is, comparatively speaking, weak and poor.

When I view the common spectacle of a large yard spread with a thin stratum of straw or stubble, and a parcel of lean straw-fed cows wandering about it, I think I see the most ingenious way of annihilating litter, without making dung, that the wit of man could have invented. Burning such straw upon the land before sowing turnips, would be an application far superior.

Cows thus managed, are amongst the most unprofitable stock that can be kept on a farm. With the best food and management, their dung is inferior; but thus kept on a wide expanse of thin litter, well drenched in rain and snow, running to ponds and ditches, they destroy much, but give little.

When a farm is rich enough to summer-graze oxen, large or small, oil-cake feeding to finish, or wait for markets, is often profitable, and the litter sure to be converted into excellent manure; but when the grass-lands will not permit this system, a farmer cannot possibly be too sparing of litter in winter. Hogs form an exception, but I know not another.

It is a fact, that stock not in fattening condition, make good dung in summer, but they do it not in winter.

But there is another equal to this important one; and that is, the food thus given going so much farther than it will do when grazed where it grows. This superiority has, in certain experiments, been marked as amounting to double, thrice, four times, and even five times as far as when eaten in the field; and when we recollect the old remark, that a beast feeds (or consumes) with five mouths, and it might be said to be with seven, we shall not be surprized at those remarks. However, that food thus given, goes much farther, cannot be doubted; thus, a much greater stock may be supported by the same farm, in one system than there can be in the other.

Two circumstances demand attention, which, if neglected, will considerably lessen the benefit to be derived from soiling. The one is, to have a plentiful provision of litter; and the other, much care in feeding; to give the beasts but little at a time: if much be tumbled carelessly before them, it heats, they pick it over, and the waste may be great; and if a cart be left in the yard loaded, the contents heat, and then cattle will not eat it. A certain degree of care is necessary in every thing: and in nothing more than in feeding all sorts of cattle. As to litter, it is an object of such importance, that provision for the system should be gradually made through the winter, if corn enough be not left for summer-thrashing to supply the beasts. All wheat-stubbles should be cut and stacked; leaves, in woodland countries, should be collected; fern procured from commons and warrens, rushes and aquatic weeds stored from fens, &c.; and if nothing else can be had, heaps of sand formed for this use; for which peat also is excellent. An enterprising, vigilant farmer, when he has such an object as this in view, will exert every nerve to be prepared for a system, the profit of which will depend so much on the care previously taken to be well provided with litter of some sort or other.

The first crop that will be ready for soiling is lucern; which may be supposed to last all the stock till the first sown winter tares are ready, when the lucern left uncut should be mown for hay. The second sown winter tares come next; then clover, to be succeeded by the third sowing of tares, and by the second growth of lucern. After this comes spring tares, and the second growth of clover: and the third cutting of lucern may follow. If chicory be applied to this use, for which it is well adapted, it will, on any good land, be mown thrice, and on very good soils four times. Thus the whole summer may be provided for, without having recourse to natural grass; but, if wanted, that also should be used in the same manner. The quantity and value of the manure thus made will surprize those who have not witnessed it, whether the stock be stalled, or kept in well-littered yards, in divisions, according to sort, size, age, fatness, value, or any other rule of separation: if they are fed carefully, have water at command, and are kept clean, all sorts will thrive to the farmer's satisfaction; and if hay be an object to him, and he has artificial food sufficient for the whole, he will be enabled to mow all that is mowable. As to horses, it is not requisite to say more than this; it is at present the system with every truly enlightened farmer in the kingdom.

CART OUT YARD-DUNG.

As this is the first time that it has been necessary to treat distinctly of this work, it will be proper to bring to our young farmer's attention a very material question, respecting all the dung he may raise on his farm, especially in the yards, stables, stalls, sties, &c.; and this is, whether it should be removed in a fresh, long, strawy state, or turned over to ferment and rot; or carted first to a compost or heap, in order for turning over and mixing, and for keeping till more rotten still? There are many variations in management, for which some better reasons ought to be given than we commonly meet with. A very common method is, to leave the dung where made till all winter feeding

ing is over, and then to turn it up where it lies into heaps, and leave it till wanted to cart on for turnips. Others, who intend it for wheat, having turned up a border or hedgreen in the field that is to be sown with wheat, cart the muck on to the earth so prepared; and afterwards, sooner or later, mix them together, and before the wheat-seeding cart it on to the land. If no border of this sort, they make a heap of it, which is afterwards turned over. These are the more general methods. Some few, thinking it beneficial to have the dung as rotten as possible, keep it *over year*, as they term it, and turn a second time. It is evident that these several methods are founded on certain ideas, that rotting is beneficial, and that more is gained in quality than is lost in quantity by that operation. This is a very important question, and well deserves many careful experiments to ascertain the real fact; but unfortunately the number of these hitherto made is so few, that they have not done much more than excite some attention to the point, and instigate several intelligent and thinking men to give more consideration to the subject than they had been accustomed to do. Mr. Thompson, of Northamptonshire, observing a spot in a field of corn better than the contiguous parts, and not being able to account for it, made inquiries among his people, and found that it was where long straw dung had been spread; the rest in a rotten state: he took the hint, and tried the comparison experimentally: the result the same. He repeated it, and was confirmed in the conclusion he drew, and from that time changed his practice. A celebrated farmer near Lewes, in Sussex, made a similar remark on the comparison between yard-muck turned up after winter, and some not stirred, and convinced himself, by repeated observations, that the latter was most advantageous. In addition to these cases, it is remarkable, that Mons. Hazenfratz, the celebrated French chemist, from experiments made on a different object, and with very different views, drew collaterally the same conclusion.

"A circumstance in favour of the Picardy farmers is, the continual transport of their dung to their fields, rather than leave it to destroy itself in the farm-yards, by waiting for fixed periods to move it. By carrying it still fresh to their fields, the heat of its first fermentation is employed in heating the soil; the little alkali which it contains, instead of being dissolved in the farm-yard, and carried away by the rain, remains in the earth and improves it, if the alkali is useful to vegetation *. The straw, yet entire, divides the soil better; its fermentation goes on less rapidly, is less advanced when the seed is sown, and, consequently, the dung is more in a state of furnishing a greater quantity of carbonic acid, which appears, with water, to be the principal aliment of plants."

I have since been informed of a variety of other cases, which seem to give much weight to this new

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* This *if* is remarkable.

opinion, that long dung is more beneficial in many applications than that which is short and rotten, and particularly upon all heavy and tenacious soils. Its superiority upon grass-land seems equally well established. Should this at last prove the real fact, it affords a curious reflection on the erroneous conduct of such multitudes of practical farmers who have been all their lives putting themselves to considerable expence in carting and re-carting, and turning and mixing, for no other purpose but to do mischief.

MOW TARES.

Very forward winter tares in a mild spring, will be ready to mow for soiling this month. Great care should be taken to make the men cut one entire stitch along the field before they begin another; and not in the common slovenly way in squares, or irregularly, so as to preclude the plough or scarifier till much is done. Whether the work is done this month or in June, it is of great importance that the tillage, whatever it may be, is given immediately; the land is thereby preparing for turnips; whereas if, from irregular mowing, the teams are kept out, and a drought should succeed, the tillage will be badly performed, and, perhaps not at all. Immediately after the scythe, whatever the weather may be, tare land is always in admirable order for tillage: loose, friable, and, if the crop has been great, putrid. It is best to plough it with Ducket's skim-coulter, which will completely turn down and bury whatever remnants of a great crop there may be, which becoming dry and fuzzy, are apt to impede the common plough, and stick out between the furrows: in this situation it does not rot, is unsightly, and injurious to the work of any implement that follows, which should be the scuffler and harrows. A little attention thus given, will save much trouble and expence afterwards. There are many operations on a farm, which can be effectively done only by means of that coulter: a farmer should, at all events, possess it; on many occasions, he will not have a more useful implement on his farm.

MOW LUCERN.

If the lucern was well manured, there will be a cutting, as already observed, towards the end of this month; however, this will necessarily depend on the season; if there are late frosts it will be much impeded, and this work not take place till June. Whenever it is fit to cut, the attentive husbandman should order his men always to mow longitudinally of the rows if drilled, or of the field if broad-cast. Left to themselves, it is twenty to one but they cut out a square, and enlarge it in such a manner, that however he might wish to give a scarifying, he will be precluded till the young growth is too forward, and will be damaged.

FOGGING,

This is a most peculiar husbandry, no where commonly practised but in South Wales. It consists in keeping the whole growth of grass in upland meadows free from either scythe or stock, and eating it in the following winter. Many years ago I knew a Suffolk clergyman who was in the regular habit of this singular practice, and spoke of it as a most profitable one. I have tried it thrice, and with success: it thickens herbage greatly, and yields far more valuable winter and spring food than any person would expect who never tried it. But it should be practised only on dry, or tolerably dry land.

JUNE.

TURNIPS.

THIS is the great season for sowing turnips: later sown crops scarcely ever arrive at the size of those sown in June. There is a common idea among the farmers, that the turnip season lasts just a month, a fortnight before, and a fortnight after Midsummer. The land, I suppose to have been ploughed for the last time but one, in May: the beginning of this month the manure should be carted on to it, which, in a well-ordered farm, should come from the farm-yard; and, if that does not yield a sufficiency to cover a fifth part of the arable land, the farmer is negligent. If he has a thorough command of litter, and money enough in his pocket to buy plenty of cattle, it will cover a third of it; but, whatever quantity of turnips he has, let him dung them well. In this work he should proceed regularly, beginning on one side of the field, and laying the heaps in lines from top to bottom; it should be spread immediately, and the ploughs follow directly to turn it in. Upon that ploughing, the seed should be sown without loss of time, and covered by two or three harrowings, according to the fineness of the land. I have sometimes seen the dung carried out long before it is ploughed in; but that is bad husbandry: for much of the goodness is carried away by the sun. It should be taken in full fermentation from the heap, and turned directly in, so as to ferment under the moulds, which will ensure a great crop. If the farm employs many teams, it will be proper to proportion them, so as to let the manuring, ploughing, and harrowing, be constantly going on, without interruption. As to the seed, observe well to sow the great round Norfolk white turnip, that lies above ground, and holds to it only by a tap-root. It grows larger than any other, and has the excellent quality of being used in winter with much greater ease than those sorts which root quite under ground, and are, consequently, not to be got at in frost. Sow about a quart an acre: less than a pint is sufficient, perhaps half a pint, if they all grow, and escape the fly; but I have seen many thin-sown pieces eaten up, when the thick-sown ones have suffered much, and yet enough escaped for a crop.

In extreme dry seasons, much seed will not vegetate; but such instances are rare: the most common misfortune is the fly, which eats them off before they gain the rough leaf. Many remedies have been proposed for this evil; but none that are effectual. Steeps for the seed very often fail. Strewing soot over the plants, as soon as attacked, will often save them, but the remedy is expensive; because, on numerous soils at this season, the soot will be of little service as a manure. The best dependence is on the richness of the soil:

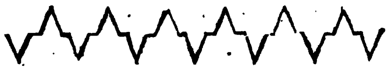
if it is extremely fertile, or full of dung, the growth of the turnips will be forced; so much accelerated, that they will presently grow out of the power of the fly. I have oftened remarked in fields partly dunged, that those lands which received no manure, have been totally eaten up, while the dunged parts have escaped. Without manure, the growth is so slow, that the enemy has many opportunities to attack the plant.

When a crop is totally destroyed, the farmers plough or scuffle and sow again, which should never be omitted, if you have time. Probably you may do this, and yet get in your crop in June, which will be a fortunate circumstance attending a first early sowing.

The directions here given for sowing turnips throughout the month of June, are for those put in before the 20th, chiefly applicable for such as are to be used before Christmas; for early sown crops are much more liable to the mildew than such as are sown later.

TURNIPS IN THE NORTHUMBERLAND METHOD.

Upon this most interesting subject, the cultivator of 500 acres annually, shall speak to our young husbandman. Mr. Culley says, " The land being made very fine, prepared, &c. as in the broad-cast method, the ploughman (where it is thought most proper to begin) sets up three sticks or poles in a right line; by having his horses yoked double, and driven by himself with cords, he sees these poles between the horses; and by keeping his plough to bear always upon the poles, he draws his first furrow as straight as possible*: in returning, he keeps his far-side horse in the new-made furrow, and his plough at such a distance as to form a one-bout ridge, like an A; by proceeding in this manner, the land, when finished, will appear thus:



the distance of these little ridges is generally from 27 to 30 inches: a less distance does not admit ploughing between the drills.

"The next operation is spreading the dung, which is performed as follows: a cart goes down every third drill, and lays the dung in small heaps; women and children follow, and with small three-pronged forks spread the dung evenly in the bottom of three drills, that is, in the one where the dung is dropped from the cart, and those on each side of it: when this is done, the ploughman splits the one-bout ridges, and covers up the dung exactly in the middle of a one-bout ridge; but before the seed can be sown, they require to be flattened at the top by a small roller, four feet eight inches long, and nine inches diameter, which flattens two ridges at once: on the top, and exactly in the *middle* of these *flattened ridges*, the seed is deposited by one or two drill-machines tied to the roller by a rope six or seven feet long, at which distance they follow the roller and each machine, guided by a man: when finished the work appears in this form:

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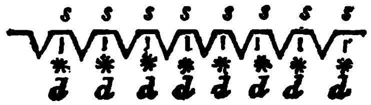
* Our Suffolk ploughmen do this in perfection, by a single white stick, even 40 rods from them at beginning.—*A. Y.*



where *s* represents the seed, and *d* the dung directly under it. The roller is drawn by one horse, driven by a boy. Setting up the one-bout ridges, and covering in the dung, are performed by a common swing-plough. The drill-machines are of various constructions: we generally sow about 1 lb. of seed to an acre, as it is better to have an abundance of plants, for fear of accidents.

"When the plants have got four leaves we begin to hoe, and leave the plants at only eight or nine inches distance in the rows: as they have so much room sideways, or from row to row, the hoers go sideways and pull the surplus plants, weeds, &c. into the hollow or space between drill and drill, and the turnip-plants are left as regular as if they had been planted with the greatest care and exactness: the hoeing is performed by women and children, and costs about 4s. per acre for two hoeings.

If the drills be made in the same direction the ridges lie, at the next ploughing for corn, the surface

face will be irregular, and the dung unequally distributed. To avoid this inconvenience, if the land be dry and level, the drills are made diagonally across the field, but if the ridges be high, it is best to make the drills directly across the ridges, and draw a plough down the furrows to take off the water.

"The quantity of dung used is from twelve to twenty-two, two horse cart-loads to an acre, according to circumstances.

"It is generally supposed that a weightier crop is produced by the drill than by the broad-cast method; but even admitting them equal in this respect, the superiority as a fallow crop must be allowed, because, by the repeated horse-hoeings or ploughings in the intervals, and hand-hoeing in the rows, you have it in your power to extirpate the whole race of annual weeds, and so much surface being exposed through the winter, makes a higher preparation for any succeeding crop. Another advantage is, the facility with which they are hoed, as a boy or a girl of nine years old can hoe them with the greatest ease, and indeed generally better than experienced *broad-cast* hoers, because these are more apt to take too many away, and leave them over thin in the rows, while the young ones, from the apprehension of hoeing them too thin, will leave the plants at any distance you fix upon.

"This mode of drilling turnips has fully established itself wherever it has been tried. Very few or no turnips are now sown broad-cast in this country; the drill system universally prevails, and is now practised even by its most virulent opponents, to the extent of several thousand acres yearly: the farms are in general very large, and there are many farmers who drill every year from 100 to 200 acres.

"In this neighbourhood, last autumn, several small parcels of turnips, drilled in the manner above described, were sold at 6l. an acre; and upon our own farms we had at least 500 acres drilled, which, I have no doubt, could have been readily sold for 2500l.; or, on an average, at 5l. an acre."

IMPROVED METHOD.

To those who are convinced that the use of long dung is beneficial, there is a method of using it for turnips, superior to all others; this is by ploughing the land on to four-foot ridges, scouring the furrows out as deep as possible, with a double mould-board plough, laying the dung in these deep furrows, and burying it by reversing the ridges: by this means, this long strawy dung is completely covered, which is effected with difficulty in common tillage, two rows of turnips at one foot are drilled on each ridge, and there are three feet of space for horse-hoeing, which admits of far more effective work than the Northumberland method. When the land comes to be ploughed for barley, the double mould-board plough again following the common plough, bottoms the dung, and spreads it for the corn.

TURNIPS AFTER TARES.

The winter tares that were sown the last week in August, or the beginning of September, will, if the season proved favourable, be mown for soiling early enough to put in turnips within this month. If manure was necessary, it should have been spread for the tares, and by that means the field will be in fine order for this crop. Much depends on management: the tares should be mown stitch by stitch longitudinally, and on no account whatever in the common random way, in a round or square portion irregularly; for, by that means, the ploughs are kept out so much longer, and if a drought succeeds, the land may not be in a state to plough till too late; but taken soon after the scythe, no land stirs better than that where tares have been mown. If the crop was large, and beaten at all to the ground, there will be an uncut stubble, which is scarcely ever turned clean in by any common ploughs; it should be attempted only with the skim-coulter, which sweeps it clean to the bottom of the furrow so buried, that the harrows drag out none. The turnip-seed should be sowed immediately, and, thus managed, there will be little fear of a crop.

They have on the South Downs an admirable practice in their course of crops, which cannot be too much commended; that of substituting a double crop of tares instead of a fallow for wheat. Let the intelligent reader give his attention to this practice, for it is worth a journey of 500 miles. They sow forward winter tares, which are fed off late in the spring with ewes and lambs: they then plough, and sow summer tares and rape, two bushels and a half of tares, and half a gallon of rape; and this they feed off with their lambs in time to plough once for wheat. A variation is for mowing: that of sowing tares only in succession, even so late as the end of June for soiling. October 6th, I saw a fine crop finishing between Lewes and Brighton, on land that had yielded a full crop of winter-sown ones. The more this husbandry is analyzed, the more excellent it will appear. The land in the fallow year is made to support the utmost possible quantity of sheep which its destination admits: the two ploughings are given at the best seasons; in autumn, for the frosts to mellow the land, and prepare it for a successive growth of weeds, and late in spring to turn them down. Between the times of giving those stirrings, the land is covered by crops. The quantity of live stock supported, yields amply in manure. The treading the soil receives previous to sowing wheat, gives an adhesion grateful to that plant: in a word, many views are answered, and a new variation from the wretched business of summer-fallowing discovered, which, by a judicious application, would be attended in great tracts of this kingdom with most happy consequences to the farmer's profit.

Another stroke of practice, which Mr. Ellman, of Shoreham, is warm for, and with great reason, is that of breaking up his layers two years (clover, tay, and trefoil) for summer tares and rape. What an immense improvement is this upon the common slovenly custom of Norfolk, of ribbling, or half, or bastard-ploughing with layers! a miserable practice, yet common amongst the cultivators of that celebrated county.

TURNIPS ON PARED AND BURNT LAND.

The lands that were pared and burned at any time previously to the time of sowing turnips, may now receive the seed. The ashes having been spread, and the field thinly ploughed with an even level furrow, will present to the eye a face of whole furrows. The best operation further to prepare the surface, is to pass over it the Norfolk heavy drill-roller, drawn by four horses, which will cut the furrows in pieces without disturbing the ashes, and has an effect in executing this work, which will be admired by all who view it. The cutting circles which move around the iron axle are only four inches asunder: if the seed be then sown, and the roller be passed again across the line of its former movement, the job will be finished in the best manner possible; but the common method of harrowing is a very bad one; and trusting the seed without any operation to cover it, causes an inequality in the plant, for it is apt to fail where it does not fall into cracks.

Every man who is, or can be in the habit of this husbandry of paring and burning, should determine to sow turnips (or coleseed) on all the land that may have been pared and burnt after potatoe-planting: many farmers are not at all solicitous upon this point, because they are so very eager to sow white corn wherever it is possible to do it with any expectation of a crop: they put in oats on all early pared: and wheat on all that is done afterwards; but the practice is erroneous, nor can I see the gain by it; for as to two crops of white corn, it is absolutely to be prohibited: and as to three or four, such management is that of a barbarian: it arises from such execrable conduct, that there are many landlords prejudiced against this excellent husbandry. If oats or wheat are taken for the first crop, turnips or cole must be the second; therefore, it is not easy to understand what the motive can be.

TURNIPS ON OLD GRASS.

Where a man is not allowed to pare and burn, or cannot do it for some other reason, he should be reminded that this crop succeeds well when sown on one earth of old turf; but it should be ploughed with a skim-coulter; then well worked, but shallow, with the scarifier, and the seed harrowed in. I have seen very good crops thus gained; and have had them myself, even without scarifying. This is much better husbandry than putting in oats first, which should follow the turnips.

TURNIPS WITH RAPE-DUST, &c.

A practice very lately introduced, and immediately adopted and extensively applied by that great patron of modern improvements, Mr. Coke of Norfolk, is to drill rape-cake dust from the same machine, and at the same time with the turnip-seed; for which purpose a machine has been very successfully made on Mr. Coke's principle, by Mr. Burrel, of Thetford. Rape-cake is a very common manure in Norfolk; when spread for turnips, it has been usual to sow it, grossly powdered, five or six weeks before the sowing the turnip-seed; but Mr. Coke has found at Holkham, that by means of grinding it to perfect powder, there is no necessity for any space of time between sowing the manure and the seed; and this may be probable enough. It is, however, a point in which comparative experiments would be valuable. By thus delivering the manure and the seed into the same pipes and shares of the machine, a ton does six acres instead of three. In whatever way the question of the time of application may be decided, still the importance of the machine remains the same; for, with various other manures, there is no question yet made of the propriety of delivering them at the same time as the seed. This is the case with bone-dust, soot, coal, and wood-ashes, dried and thrashed pigeons' dung, powdered night-soil, and many others. Soot must, however, be mixed with some rougher powder, to prevent the cups smoothing their way in it, and by pressure preventing the delivery. These are all cheap ways of manuring for turnips; and, as the seed and the manure are deposited in close contact, the plants receive immediate benefit, and obtain that quick growth in their early state, which enables them best to escape the fly.

SWEDISH TURNIP.

A second, or perhaps a third sowing of this very valuable plant, should take place in this month: see the directions in May. And if the former sowing was eaten up by the fly, the land should be well scuffled and fresh sown.

CABBAGES.

Upon your cabbage-lands you should pursue the same maxims as above laid down for turnips, only in ploughing the manure in, always throw the land on to the ridge, and set the plants in a single row on the top of each: so the dung is covered up in the ridges, and the plants in a proper situation for profiting by it to the utmost. As to the distance of the rows, you must be guided absolutely by the richness of the soil: if you find the plants join from row to row, when at four feet, then you have proof that they should not be planted nearer; but, if they no more than join on three-feet rows, then you would lose in the crop if you gave a greater distance: two feet from plant to plant, is the proper distance.

When the manure is spread and turned in, the proper way of planting will be to send women or children in with bundles of plants, to drop them on the tops of the ridges, at about two feet distance. They will lay ready for the men, who may then plant almost as fast as they can walk: but, if they have to get, carry, and set the plants, they will not be able to do near the work they might with better contrivance. The rows at four feet may be planted at five shillings an acre. It is a rule among the cabbage-planters in husbandry, never to water the plants, let the season be as dry as it may, insisting that it is entirely useless. Upon this I shall venture to remark, that in most years, if the land is in fine tilth, and well dunged, this may be right, as the expence must be considerable: but I should apprehend that, in very dry seasons, when the new-set plants have nothing but a burning sun on them, that watering would save the lives of vast numbers, and might answer the expence, *if a pond is near*, and the work done with a water-cart.

There is one use in cabbages, which appears not to have met with the attention it merits: it is the planting on those lands where turnips have failed. A late-sown crop of those roots comes not often to a profitable amount; but cabbages planted on the land, without any fresh ploughing, would turn out a beneficial crop for sheep late in the spring: in all probability (unless on very light, sandy, or limestone soils), of greater value than the turnips, had they succeeded.

No farmer can entertain too high sentiments of the necessity of gaining crops of green winter food: the importance of having such food for his cattle, and not depending totally on hay, is one of the clearest axioms in the whole range of husbandry. His profits will be amazingly lessened: his loss in the want of manure felt severely for many years, and on farms not abounding with hay, his expence in buying it, or his loss in selling his cattle, will be equally great. But, besides these accumulated evils, there is another of a different nature, which he should consider well: it is the change of his course of crops. After either turnips or cabbages, he sows spring corn, and with that spring corn, seeds. On some soils, the grass is left but one year, in others two, and in others, mixed with ray-grass, &c. longer. The lay is ploughed up, and corn at once harrowed in. This is compendious, cheap, and yet excellent husbandry; for the duration of the grass is a constant fund of profit, at scarcely any expence, and the preparation for corn is carrying on in the most beneficial manner. But if the turnips fail, and no cabbages planted, what is the consequence? Why, the farmer sows wheat on the fallow, in hopes of a good crop, to pay him for so much tillage as the land has received. This introduction of that grain at once breaks the whole arrangement of his farm, and he is forced either to begin again, or to pursue that pernicious husbandry of sowing two crops of white corn running. He must either fallow for turnips again, or take a crop of barley, and then turnips: thus he is thrown out of his clover, though as important a crop as any on his farm, and launches into a series of tillage, that cannot but prove very expensive to him, without repaying the benefit that the clover-course would have done.

For these reasons, when the turnips fail, and cabbages are not planted, the land should be laid up in winter for barley, and the clover sown with it, which will turn out far more profitable than throwing in wheat.

The cabbages planted in April, and hand-hoed and horse-hoed in May, should now have the second of each of those operations given: a hand-hoeing in the middle of the month, which must cut up all weeds, and break the earth well of the narrow slip on which the plants were left. Towards the latter end, the double earth-board plough should go in the intervals, splitting the ridge thrown up in May, and returning it to the rows. These operations will be of great utility to the crop.

The cabbages drilled in April where to remain, will demand much attention this month, to keep them at a proper distance, the tops of the ridges well hand-hoed, and the intervals shimmed, that they may be gradually reducing to a fine state of pulverization. In all horse-hoed crops, these works should be particularly attended to while the plants are young; for when they are much branched out, the instruments cannot perform the work with any thing like the same effect.

CABBAGE FALLOW.

If a drought happens in the month of June, and the preparation of the fallow be not very forward, a farmer may be caught with his clods not sufficiently reduced to form the ridges: in this case, there is a tool so effective, that the following minute of my own practice may be worth attention.

In preparing my fallows for cabbages this year, (1793), I found a use in the Norfolk drill-roller, which I had not discovered before: I had got a ten-acred field, by heavy rolling and harrowing, and repeated tillage, into pretty good order, and the dung well buried ready for the plants: this field was finished about the 9th of June: at the same time another ten acres were preparing; but here, instead of a large two-ox roller covered with lead, I ordered my bailiff to try the drill-roller, which requires four oxen: the effect was very great indeed: the clods, from a long series of continued dry weather, were large in spite of five ploughings, and much rolling and harrowing; but once going over with this most effective tool, cut and bruised them to atoms, so that the land then ridged up for dung is in excellent order. I have seen very powerful spiky rollers used, but not with equal effect. I should, however, observe, that no tool in the world can be expected to operate, if a fallow be not prepared properly; that is, ploughed once before winter, and cross ploughed the moment the north-east winds enable the teams to go on to the land: this year I ribbled one field across, and clean-ploughed one: the latter is by far the most effective, and leaves the fallow rougher and more exposed to drying winds. Rain is of great use in pulverization, for a common pair of harrows, at the right moment, will reduce the roughest land to a fine state; but there is a vast difference to the temper of the land between reducing it while quite dry, and while wet or even moist: in the former case, friability is entirely preserved; in the latter, the *tread* of the horses is a pressure, which forms that which will become a fresh clod, and of the worst sort. It may be accepted as a rule in tillage, to work wet and strong soils when quite dry; and of all barbarous management, nothing is so abominable as to let dry seasons pass, in order to plough such lands when rain comes. This Norfolk drill-roller is so effective an instrument for the purpose, that a strong-land farmer should not be without one: in such a season as this has been, no common tool will reduce land; and for cabbages, the time of rain must be used for setting out the plants, and not lost for pulverizing the land, in order to be planting afterwards in dry weather, or, what is as bad, watering at an expence too great to bear.

CARROTS.

The carrot crop will, in all probability, require a hoeing this month, about the latter end of it. It should be performed with common hoes, and the men who execute it, should take good care to kill all remaining weeds, and wherever they left the carrots double before, to set them out to the proper distances. This being the third hoeing, the land should be left in such order, as to require no more work, or, at least, nothing more than once going over it the latter end of August, to cut up straggling weeds, which may by that time have arisen.

POTATOES.

Another hand-hoeing must be given to the potatoe crop, which should be so effectually performed, as to preclude the necessity of any succeeding ones; because the plants will be too much grown to be hoed without damage in the operation, The crops planted in rows for horse-hoeing must have the second this month, given with the double mould-board plough: it must split the ridge before thrown up, and lay it equally to the rows.

MADDER.

Another hand-hoeing must be given to the madder crops this month, in which the labourers must be extremely attentive not to damage the crop; for the branches will be grown considerably, and they are so remarkably brittle, that the least rough usage breaks and damages them: they must not use longer than six or eight-inch hoes. The latter end of the month, the first horse-hoeing should be given. Put two horses, one before the other, in the swing-plough, and turn a furrow on each side *from* the plants, which will consequently throw up a ridge in the middle of each interval, and so it should be left till the next month.

LIQUORICE.

This month the liquorice-plantation must be hand-hoed again. Let the work be carefully performed with small hoes; but the plant not being nearly so brittle as madder, it will not require so much nicety in the management.

HOPS.

If tying the binds to the poles was not finished last month, it should be done early in this; which is also a busy season for cultivating the intervals in the various methods practised in different hop districts. About Midsummer, hops at Farnham are pruned by cutting off the spare vines: these are the perquisite of the work-people, who keep them for hay in stacks to feed their cows, if they have any, if not, they sell to those who have.

FLAX.

Weed the young flax: this is an expensive operation; but the crop depends on it; it must therefore be effectually performed.

LUCERN.

The lucern, drilled in the spring, will now want a very careful attendance. It will not be advisable to horse-hoe it the first year, because its great tenderness will not bear any accidental evils that may arise in the operation; but the hand-hoes should be kept diligently at work; the land kept throughout this month perfectly free from weeds, and the surface well broken by the hoes, to prevent any degree of binding. While the men are hoeing, they should never omit to stoop and pluck out such weeds with their fingers, as grow among the plants in the rows: this is highly necessary; for, if they are left, they will injure the young lucern much. Whoever cultivates this grass, must absolutely determine to spare no expence in the eradication of weeds. There is no plant will bear the neighbourhood of weeds so badly, and especially while it is young. If the hand-hoes are applied in time, and often enough, the expence will not be great; but if, through saving, you defer it till they are gotten much a-head, the crop will either be lost, or the expence of cleaning enormous.

The old crops of drilled lucern will be ready for cutting this month.

SAINFOIN.

The latter end of June, the sainfoin crops will, in general, be ready to mow: they should always be made into hay; for no grass in the world answers so well for that purpose. It is a common thing, to gain two tons per acre on dry land that with any other crop would yield none at all: and the after grass is extremely valuable, much more so alone, than the former value of the land.

Making the hay is the simplest of operations; never offer to shake out the swath, for it should be moved as little as possible, in order to preserve the leaf; leave the swaths long enough according to the weather, to be nearly made, then turn them over, and leave them till ready to cock or cart. If the crop is very great, or the weather unfavourable, other turnings may be necessary, but be not too busy.

CLOVER.

The latter end of June, the clover crops will be ready to mow. In many situations it will not be advisable to feed any more of it than can be dispensed with, the hay paying so much better.

In the making of all artificial grasses into hay, particularly clover and sainfoin, it should be observed to act quite differently from the making natural grass. The latter is strewed about soon after mowing; but the former should lie in swath a day or two, then turned carefully, and lie a day or two longer. In good weather, this makes it sufficiently. It may then be got into cocks, in which it should remain about two days, and then carted to the stack. The whole is a very easy and cheap process.

MEADOWS.

The very early or rich meadows, and the highly manured upland pastures, about great cities, will be ready to mow in June. In executing the work, observe particularly, that the labourers cut as close

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to the ground as possible: grass never thrives well that is not mown quite close, and the loss in the crop of hay is very considerable; for one inch at bottom weighs more than several at top. In the making it into hay, you will be a loser, if you have not many hands ready for the work. It should be shaken-out directly after the scythe; wind-rowed, that is, raked into rows, before the evening, shaken out again next morning, and in the afternoon got into grass-cocks: these should be opened the morning following, and got into the great cock by night; by which time the hay will be well made, if no rain comes; but in case of bad weather the process will be more tedious. If successive rains come, so that the hay is damaged, and you are fearful of its turning out unprofitably, by all means salt as you stack it; a peck strewed in layers on the stack to a load of hay: it will have a very great effect in sweetening, however bad it may be, even to blackness; and it has been found by experiment, that horses and horned cattle will eat damaged hay salted, which they would not touch without that addition.

The following is the process in Middlesex:

This branch of the rural arts has, by the farmers of Middlesex, been brought to a degree of perfection altogether unequalled by any other part of the kingdom. The neat husbandry, and superior skill and management that are so much, and justly, admired in the *arable* farmers of the best cultivated districts, may, with equal justice and propriety, be said to belong, in a very eminent degree, to the *hay* farmers of Middlesex, for by them may very fairly be claimed the merit of having reduced the art of making good hay into a regular system; which, after having stood the test of long practice and experience, is found to be attended with the most desirable success. Even in the most unfavourable weather, the hay made according to the Middlesex manner, is superior to that made by any other method under similar circumstances. It is to be regretted that this very excellent practice has not yet, except in a very few instances, travelled beyond the borders of the county. But as it most justly deserves the attention and imitation of farmers in other districts, I shall, for their information, endeavour minutely to describe the method in which the Middlesex farmers make their hay.

In order that the subject may be more clearly understood, I shall relate the particular operations of each day, during the whole process, from the moment in which the mower first applies his scythe, to that in which the hay is secured either in the barn or in the stack. Before I enter more immediately on this task, I would just premise a few observations, viz. when the grass is nearly fit for mowing, the Middlesex farmer endeavours to select the best mowers, in number proportioned to the quantity of his grass, and the length of time it would be advisable to have it in hand; which having done, he letts it out as piece-work, or to be mown by the acre*.

About the same time he provides five hay-makers (men and women†) to each mower. These last are paid by the day, the men attending from six till six; but the women only from eight till six: for an extra hour or so in the evening, when the business requires dispatch, they receive a proportionate allowance.

The mowers usually begin their work at three, four, or five o'clock in the morning, and continue to labour till seven or eight at night; resting an hour or two in the middle of the day.

Every hay-maker is expected to come provided with a fork and a rake of his own; but when the grass is ready, and labourers scarce, the farmer is frequently obliged to provide both; but for the most part only the rake.

Every part of the operation is carried on with forks, except clearing the ground, which is done with rakes, and loading the carts, which is done by hand.

Having premised so much, I now come to the description of the business of the

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* Each man mows from an acre and a half to an acre and three quarters per day: some there are who do two acres per day, during the whole season.—*J. M.*

† Including loaders, pitchers, and stackers, and all others.—*J. M.*

First Day.—All the grass mown *before* nine o'clock in the morning is tedded (or spread), and great care taken to shake it out of every lump, and to strew it evenly over all the ground. Soon afterwards it is turned, with the same degree of care and attention; and if, from the number of hands, they are able to turn the whole again, they do so, or at least as much of it as they can till twelve or one o'clock, at which time they dine. The first thing to be done after dinner, is to take it into what are called *single* wind-rows*; and the last operation of this day is to put it into grass-cocks.

Second Day.—The business of this day commences with tedding all the grass that was mown the first day *after* nine o'clock, and all that was mown this day before nine o'clock. Next, the grass-cocks are to be well shaken out into staddles (or separate plants) of five or six yards diameter. If the crop should be so thin and light as to leave the spaces between these staddles rather large, such spaces must be immediately raked clean, and the rakings mixed with the other hay, in order to its all drying of an uniform colour. The next business is to turn the staddles, and after that to turn the grass that was tedded in the first part of the morning once or twice, in the manner described for the first day. This should all be done before twelve or one o'clock, so that the whole may lie to dry while the work-people are at dinner. After dinner, the first thing to be done is, to rake the staddles into *double* wind-rows*; next, to rake the grass into *single* wind-rows; then the double wind-rows are put into bastard-cocks; and lastly, the single wind-rows are put into grass-cocks. This completes the work of the second day.

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* That is, they all rake in such manner, as that each person makes a row, which rows are three or four feet apart.—*J. M.*

Third Day.—The grass mown and not spread on the second day, and also that mown in the early part of this day, is first to be tedded in the morning; and then the grass-cocks are to be spread into staddles, as before, and the bastard-cocks into staddles of less extent. These lesser staddles, though last spread, are first turned, then those which were in grass-cocks; and next, the grass is turned once or twice before twelve or one o'clock, when the people go to dinner as usual. If the weather has proved sunny and fine, the hay which was last night in bastard-cocks, will this afternoon be in a proper state to be carried†; but if the weather should, on the contrary, have been cool and cloudy, no part of it probably will be fit to carry. In that case, the first thing set about after dinner, is to rake that which was in grass-cocks last night, into double wind-rows; then the grass which was this morning spread from the swaths, into single wind-rows. After this, the hay which was last night in bastard-cocks, is made up into full sized cocks, and care taken to rake the hay up clean, and also to put the rakings upon the top of each cock. Next, the double wind-rows are put into bastard-cocks, and the single wind-rows into grass-cocks, as on the preceding days.

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* In doing which, every two persons rake the hay in opposite directions, or towards each other, and by that means form a row between them of double the size of a single wind-row. Each of these double wind-rows are about six or eight feet distant from each other—*J. M.*

† It seldom happens in dry weather, but that it may be carried on the third day.—*J. M.*

Fourth Day.—On this day, the great cocks just mentioned, are usually carried before dinner. The other operations of the day are such, and in the same order, as before described, and are continued daily until the hay harvest is completed.

In the course of hay-making, the grass should, as much as possible, be protected both day and night, against rain and dew, by cocking. Care should also be taken to proportion the number of hay-makers to that of the mowers, so that there may not be more grass in hand, at any one time, than can be managed according to the foregoing process. This proportion is about 20 hay-makers (of which number 12 may be women) to four mowers: the latter are sometimes taken half a day to assist the former. But in hot, windy, or very drying weather, a greater proportion of hay-makers will be required than when the weather is cloudy and cool.

It is particularly necessary to guard against spreading more hay than the number of hands can get into cock the same day, or before rain. In showery and uncertain weather, the grass may sometimes be suffered to lie three, four, or even five days in swath. But before it has lain long enough for the under side of the swath to become yellow (which, if suffered to lie long, would be the case , particular care should be taken to turn the swaths with the heads of the rakes. In this state it will cure so much in about two days, as only to require being tedded a few hours, when the weather is fine, previous to its being put together and carried. In this manner hay may be made and stacked at a small expence, and of a good colour, but the tops and bottoms of the grass are insufficiently separated by it.

There are no hay-stacks more neatly formed, nor better secured, than those of Middlesex. At every vacant time, while the stack is carrying up, the men are employed in pulling it, with their hands, into a proper shape; and, about a week after it is finished, the whole roof is properly thatched, and then secured from receiving any damage from the wind, by means of a straw rope extended along the eaves, up the ends, and near the ridge. The ends of the thatch are afterwards cut evenly below the eaves of the stack, just of sufficient length for the rain-water to drip quite clear of the hay. When the stack happens to be placed in a situation which may be suspected of being too damp in the winter, a trench of about six or eight inches deep is dug round, and nearly close to it, which serves to convey all the water from the spot, and render it perfectly dry and secure.

The Middlesex farmers are desirous of preserving the green colour of their hay as much as possible, though a lightish brown is of no disservice to it. Hay of a *deep* brown colour, occasioned by its having heated too much in the stack, is said to weaken the horses that eat it, by promoting an excess of urine, and consequently it sells at a reduced price*.

In the making of hay, some attention should be paid to the quality of the soil, and the kind of herbage growing on it. *The hard, benty hay, of a poor soil, is in little or no danger of firing in the stack; and should,* therefore, *be put very early together, in order to promote a considerable perspiration, as the only means of imparting a flavour to such hay, which will make it agreeable to horses and lean cattle:* it will be nearly unfit for every other sort of stock.

It is the succulent herbage of rich land, or land highly manured, that is more likely to generate heat

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* *Observation.*—If you would make your hay come out of the stack of a fine colour, and the beauty of the flowers to appear, the hay you have shaken out of bastard-cocks to prepare for carting, should be cocked in the heat, and remain till the next morning; then turn and open the cocks, for the air to take away the damp that is collected, which otherwise would heat in the stack, and, of course, the beauty of the colour would be done away.

sufficient to burst into flame, as it has sometimes done: of course, the grass from such land must have more time allowed in making it into hay. This the Middlesex farmers are perfectly aware of; and, when the weather proves moderately drying, they make most excellent hay. But when very hot or scorching, they, as well as most other farmers, under similar circumstances, are sometimes mistaken. In such weather the grass becomes crisp, rustless, and handles like hay before the sap is sufficiently dissipated for it to be in a state fit to be put into large stacks. But if that be done when it is thus insufficiently made, it generally heats too much, sometimes becomes *mow-burnt*, and in some cases, though very rarely, has taken fire*.

'*The great quantity they have in hand at the same time, makes it extremely difficult to carry the whole just at the moment it is sufficiently made:* although it is certainly of considerable consequence that it should be so, *in order to its yielding the greatest possible weight*, and preserving its best quality; as, every minute after that precise time, it continues to lose, both in weight, and in its nutritious properties, by evaporation†. Even the difference of an hour, in a very hot drying day, is supposed to occasion a loss of 15 to 20 per cent. on the hay, by its being carried beyond the point of perfection, and frequently even a greater loss is sustained.

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* Hay stacked in a barn in the same state, would not heat too much; and as to firing, no such thing was ever known.—*J. M.*

† Every thing we smell affords proof positive, that more than watery particles evaporate.—*J. M.*

The expences are, per acre, as under, viz.

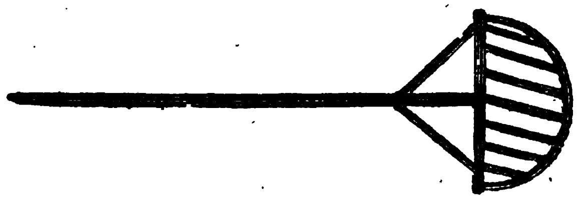
Mowing 3*s*.; beer 6*d*.	£.0	3	6
Making and stacking, ...	0	9	6
Pulling the stack, and laying the hay pulled out, upon the stack, ...	0	0	6
Horses, harness, and carts, ...	0	2	6
Straw for thatch 3*s*.; thatcher and labourer 6*d*.	0	3	6
Total expence per acre in the stack-yard is	19*s*. or 20*s*.		

—*Middleton.*

METHOD USED IN SUFFOLK.

In making hay, the following method should be pursued.

First Day.—Shake out the swarth till 12 o'clock, but do nothing with such as is mown after 12. When it has been spread three hours, wind-row it, that is, draw it into small lines with rakes: and in the evening, before the dew falls, make it into grass-cocks, by drawing the rows before you with a rake sliding on the back: this will be better done if the rake is made stronger than common, and with teeth thus capt:



Second Day.—Shake out what was mown the first day after 12 o'clock, also what is mown the present day before 12, to be treated afterwards as directed before. That which was grass-cocked yesterday is to be shook into rows, so as not to occpuy all the surface of the meadow; in two or three hours raked into a row; and in the evening put into cocks of two or three hundred weight.

Third Day.—Break those cocks about eleven o'clock, into a long bed; between twelve and one rake them into rows, and about three or four cock them, each bed in a cock. In these cocks, which will contain four or five hundred weight of hay, let it remain till the whole field is done, and on the cock. In the morning of the day you cart, open, and give them an airing; then put in cart, and stack. All this on the supposition of fine weather.

In this method there are three operations every day, which are more essential in hot burning weather than in a wet season; if the hay is moved only twice in a day, the same surface will be exposed six or eight hours to the sun, which will damage it almost as much as rain. The great object is to move it so often that the sun shall not have power to extract so much of the sap as to change entirely the colour of the hay, upon which also depends its scent and nourishment. There are many plants gathered for their physical virtues, which would be good for little if not dried under cover. The finest green hay is made when there happens to be a dry season with very little sun. The common farmers are perfectly contented to let a burning sun shine day after day on their hay, and think themselves happy in carrying home hay with neither scent, colour, sap, nor value. It is upon this account that I shake out over the whole ground but once, which is the first day. The second I keep it very thick upon the ground; and the third (if the sun shines hot) I but open the cocks to give them an airing. I have directed the large cocks to remain till the field is finished, that all may be carted at once; there are several reasons for this: *First*, economy, for much more hay can be made and got into the cock than can be carted and stacked, and carting for a small quantity loses much time in getting the teams ready, and in moving from one work to another. *Second*, I would wish the hay to take a slight sweat in the cocks; if it is carted as soon as made, the sweat will be so great in the stack, as entirely to take away the colour, whereas it should be no more than sufficient (with very good treading) to consolidate the stack. *Third*, the hay is perfectly safe in a well-made cock, let the weather be what it may.

Getting together the hay for cocking, is the hardest work in hay-making, and can only be done by two stout men setting their forks together and rolling it over—it takes much time and strength; to save this I have used a very simple contrivance, which has a prodigious effect: it is a frame of timber twelve feet long and five feet high, drawn by two horses, one on each side the row of hay that is put in ready for cocking; this drives it up with such expedition, that twenty men could not equal it. For want of the frame, at first I used a common hurdle, with a cart rope run through it to draw by. But the right machine is much better, and requires fewer hands to work it, as there must be two persons to hold the hurdle, and rest on it with their feet as the hay gathers.

In making hay upon paper, it is easy to suppose nothing but fair weather; but that will not do for the practical farmer. In case of rain he must act differently from the above directions. If it falls in the morning, the grass in swarth must be left for shaking out till it is fair. If it falls after it is shaken out, it will probably prevent the wind-rowing in the middle of the day, in which case it should not be made on to the grass-cock at night, but put instead of it on to the double wind-row, that is, one rake drawing the row one way and another doubling it, by bringing as much to it the contrary way: in this method the hay will be left so as to dry, and if rain comes again, will save itself much better than if it was left spread on the land. The next day these rows, if not quite dry, may be turned, then drove up in large rows, and cocked at night; but if dry the turning may be omitted.

In case the rain catches you after the hay is wind-rowed, it should be left till nearly dry, then run into rows—those rows turned, and drove up in heaps for cocking.

If the weather changes to rain after cocks are broken and laid into beds, when the surface is dry, those beds, if very thick, should be turned with a fork; if they are not thick, wind-rowed, and in the evening when dry, cocked.

When a meadow is well stocked with those herbaceous plants which I have recommended as being the best, the hay should be shaked out (after the first time) as little as possible; for when it has been wet and dry alternately, and a hot sun comes in, by too much stirring of that kind the leaf drops off, and the value of the hay is much lessened: hence, do not dry hay that has been wet, by shaking.

If the rain falls on a large row after it is put in for driving together for cocking, it must, when the surface is dry, be turned with the fork, spreading it on a wider space at the same time, then put together again as before.

The mode of hay-making here recommended, will require five hands (one man, and four women or lads) to every scythe.

WATERED MEADOWS.

These come in for mowing this month. Mr. Boswell directs, that as soon as the hay is cleared, cattle of any sort (no sheep) should be turned in for a week to eat the grass out of the trenches, and what may be left by the mowers. Then the water should be worked on them, care being taken to let it only dribble over every part as thinly as possible, this being the warmest season of the year. The first watering should not last longer than two or three days, before it is shifted to another meadow: there will soon be an after-grass of such a rich and beautiful verdure as will astonish a spectator not accustomed to it; and the quantity and quality will be beyond conception, compared with the state the lands were in before they were watered. Mr. Boswell further cautions his reader to guard by all means against keeping the water too long upon the meadow in warm weather. It will very soon produce a white substance like cream, which is prejudicial to the grass, and shews it has been upon the ground too long already; but if permitted to remain a little longer, a thick scum will settle upon the grass, of the consistence of glue, and as tough as leather, which will quite destroy it.

FEEDING AND MOWING.

Relative to the application of grass, there are some common opinions, which I heard so often canvassed, or rather asserted, in discourse, that I gave a particular attention to them on my own farm. It has been said more than once, that mowing land exhausts it more than feeding; and that pastures should be alternately fed and mown, upon the same principles that arable lands are fallowed. I have remarked the effects of both on several of my fields, and also on my neighbours', and therefore can speak to it from better authority than mere conjecture. Several grass-fields on this estate, and some of my own, have been mown every year as long as the labourers remember: I have a minute of 22 successive crops of hay in one field, and yet neither that, nor any of the rest, shew more signs of being exhausted than others on similar soils that have been fed. Here are fields that have been constantly mown, separated only by a hedge from others that have been often fed; the soil and treatment in other respects alike; and yet the one are as good as the other: nor are the few crops taken from the fed lands better than those from others mown. I have fed parts of fields, and mown parts, and the year following mown the whole, nor could I perceive a difference.

Why is feeding thought to be so beneficial, as to rank with a fallow? upon what principles? it can only be the appearance of a large burthen of hay at once upon the ground, that constitutes so strong an idea of a crop; and the notion of cattle in feeding manuring the land greatly. As to the product, it is, probably, nearly the same when fed as when mown; only the eating as fast as it grows, prevents the *quantity* appearing: the argument is, therefore, reduced to the manuring received from the cattle in feeding.

That this is not of much consequence from great cattle, I think there is reason to suppose. In the first place, it is not laid on in one body, so as to occasion a fermentation in the soil. In the next, it is dropped at an unfavourable season, summer. It is also in such irregular quantities as to do mischief. Great cattle, while they dung, stand still, and drop the whole in one spot; no grass is there to be found for a twelvemonth; and when it does come, it is often rank, and left uneaten, occasioning loss, unless the scythe follows: and the quantity of grass thus hurt for a season is not inconsiderable.

Perhaps the treading of heavy cattle is hurtful to the grass; the surface of the ground is too compact and bound without such an addition.

But the land receiving little benefit from feeding is not the only point: I conceive that a crop, such as we mow for hay, if cut early, is of benefit to it, from being at once on the land. The thick shade in the summer breeds a fermentation, opens and loosens the surface; of which any one may be convinced, who examines the surface of two grass fields, one fed and the other mown: and it must be a benefit to loosen the soil for the roots and fibres that are in general so bound and matted. These, I apprehend, are the reasons for the fact observed. But extend the argument, and suppose the hay converted to dung in the farm-yard, and then carried on to the field in proper quantities, and at a proper season, it is clear enough (all expences carried to account) which method will have the advantage. Close feeding by sheep, to render pasturage fine, is another inquiry; it has great merit, but should be every year on the same fields.

THE TEAMS.

Continue to soil your horses and oxen in the stables, or under sheds, upon lucern mown every day or two, and take care to have great plenty of litter, to spread under them, for treading into dung. They will raise immense quantities of most valuable manure with this management, and at the same time be kept at a much cheaper rate than if turned into any kind of pasture.

HORSE-HOEING.

The drilled crops of pease and beans, must be horse-hoed at least once in June. If they had received a first horse-hoeing in May, then this of June must reverse it: throw the earth back again to the rows, splitting the ridge in the middle of the interval. In these works of horse-hoeing, the plough should not be carried nearer the rows of corn than four inches: even at that distance, some of the corn will be apt to be buried.

FALLOWS.

The fallows, whether for wheat or barley, if in common management, should this month receive a stirring; by which the crops of weeds that have arisen since the land was ploughed and harrowed fine, the latter end of April, or the beginning of May, will all be turned in and destroyed.

But in the more modern management, it is not necessary to give any ploughing this month; the weeds are better destroyed by the broad shim, or by the scufflers, which should work till just before harvest, and then one earth if wanted will be effective.

BUCK-WHEAT.

This crop bearing to be sown so late, is, in many cases, a most valuable circumstance. By means of it, you have time to get the land into extreme good order, and quite free from seed-weeds. If the stubbles are broken up in October, he must be an indolent farmer that cannot get his land fine and clean by the middle of June.

BUCK-WHEAT AFTER TARES.

This is a very beneficial system, which was first explained by the Rev. Mr. Mosely, of Suffolk, and it is so much deserving of attention, that I shall insert his own account of it.

The excellent Norfolk method of managing light lands, I generally adhere to, viz. turnips, barley, clover, and wheat; but finding, from a failure of clover in my two last crops after barley, that the succeeding ones were not equal to my expectation, I determined to try something as a substitute for that excellent preparation. Tares, I was aware, were frequently sown, and excellent crops of wheat have succeeded; but, as there were near three months between the time of cutting tares and sowing wheat, I thought that something might be done in the interim, in order, not only to keep the land clean, but to improve the succeeding crop.

It was necessary to consider what would answer this end, that would not be attended with considerable expence: buck-wheat claimed the preference, as it was of quick growth, and had been recommended as a strong and lasting manure. I therefore determined to try the effects of it, and have reason to think that my expectation was not too much raised; for although I cannot with that certainty ascertain the real produce of the land as I can wish, as a considerable quantity of the wheat has been destroyed by vermin, yet still have I had the satisfaction of lodging in my granary as much as I usually have done in the common method of husbandry. The loss I sustained was, indeed, very considerable, from such small animals as mice, for there was not a rat in the barn, and will be a standing memorial to me for thrashing my corn in the proper season. It was computed at one-fourth of the whole crop. But, even deducting the loss, and allowing the increase to be equal to former years, will it not be right sometimes to alter the usual course, and substitute a preparation equally profitable as clover for the farmer's grand crop, wheat?

The land upon which this experiment was made, was light, and produced excellent turnips and barley, but seldom more than a moderate crop of wheat: 20 bushels per acre were as much as might be expected in a good season.

But although I cannot speak with precision in regard to the wheat crop, yet I can thus far affirm, that the additional profit from the rye, as spring feed, which succeeded the wheat, was more than equal to the original price of the buck-wheat. How long the effects of this manure will continue, I cannot possibly say: but from the luxuriance of the rye, should not have made the least doubt of its operative qualities to the ripening that crop. The expence is trifling, for you cannot find any manure, even for a single crop, equal in all respects to this for 5s. which is, in general, the price of two bushels, and is sufficient for one acre.

But a material advantage there certainly is from two vegetable crops, the one immediately succeeding the other, in cleaning the land, for although the rye was sown as soon as I could conveniently plough after the haulm was carried off, yet, upon breaking up the land after the rye was fed off, it was much cleaner than it was after the last fallow.

I wish I could have drawn a more accurate conclusion from this experiment, as I find that it is the first that has been made in this manner; and would not have troubled you with this, had it not been by your particular desire, it being impossible to ascertain precisely the loss I sustained, consequently mere presumption to offer any thing as certain from it.

I hope hereafter to be more accurate, as I have six acres which have produced this season 12 waggon loads of tares, and are now sown with buckwheat, to be ploughed in the end of this month (June) as a preparation for wheat.

Note.—The year after, the field contained near six acres, including borders, and the produce was 29 coombs 2 bushels of clean wheat; so that it may reasonably be set at five coombs per acre, which is a much larger crop than I expected.

SHEEP.

In this month, the flocks of stock sheep are regularly managed: they live on the commons and sheep-walks, with little change or trouble. The stock intended for fatting, such, for instance, as wethers bought in April or May, and intended to be sold fat from turnips or cabbages the following winter, should be well kept.

WASH AND SHEAR SHEEP.

The first object in this work is to provide a convenient place for washing. It is common for men to stand in the water for it, by which they sometimes get bad colds and rheumatic complaints, and must besides be well supplied with gin: so disagreeably situated, they hurry over the work, and the wool suffers; a stream or pond offers the requisite opportunity for doing it well, and at the same time comfortably to the men. Rail off a portion of the water for the sheep to walk into by a sloped mouth at one end, and to walk out by another at the other end, with a depth sufficient at one part for them to swim; pave the whole: the breadth need not be more than six or seven feet; at one spot let in on each side of this passage, where the depth is just sufficient for the water to flow over the sheep's back, a cask either fixed or leaded, for a man to stand in dry; the sheep being in the water between them, they wash in perfection, and pushing them on, they swim through the deep part, and walk out at the other mouth, where is a clean pen, or a very clean dry pasture, to receive them. Of course there is a bridge railway to the tubs; and a pen at the first mouth of the water, whence the sheep are turned into it, where they may be soaking a few minutes before being driven to the washers.

Shearing is a business very ill performed in many parts of the kingdom, so that it is probable that one or two ounces of wool are left on an average on all the sheep in it, which is mischievous to the next growth; for wool is in this respect like grass, it will not thrive well if it be not cut close. This bad clipping arises much from longitudinal cutting. The improvement of clipping circularly round the body of the sheep began in Lincolnshire, and thence passed into Leicestershire. The Earl of Egremont was assiduous in introducing it into Sussex, the Duke of Bedford into Bedfordshire, and Mr. Coke into Norfolk; so that gradually it will spread over the kingdom. Possibly the motive for this mode of shearing was to add to the beauty of the animal. I know not whether there are shearers who can cut as close in a different direction, but I never saw it done. In winding the wool, there are some absurd acts of parliament which operate: confidence in the common course of business ensures good washing, and so it will fair winding; for he who once sells dirt clots and sand for wool, will find the loss when he deals again.

In common clipping, the pay per score is 2s. 6d. to 3s 6d. for washing, clipping, and winding; labour being at 1s. 6d. a day.

THE FLY.

Sheep that are kept in enclosures, and especially in a woodland country, should be examined every day, lest they be fly-struck: in 24 hours it may be almost past cure.

"As a preventive of the fly, the midland shepherds use curious applications, especially to the lambs. Train-oil is found to be efficacious; but it fouls the wool, and makes the sheep disagreeable to touch. An ointment made of butter and the flowers of sulphur, seems to be in the best repute*.

"Insects certainly have their antipathies, and to find out those of the sheep-fly, is an interesting subject of inquiry.

"The method of destroying maggots here, is effectual, and if applied in time, simple and easy. Instead of cutting the wool off the part affected, and scraping off the maggots with the points of the shears, the wool is parted, and the maggots picked out with a knife, or otherwise dislodged, without breaking the coat; and a small quantity of white lead scraped from a lump, among the wool; which being agitated, the powder is carried evenly down to the wound. Too much, discolours the wool: a little prevents any further harm from the maggots that may be left among the wool, driving them away from the wound: and, at the same time, is found to promote its healing. In well shepherded flocks, which are seen regularly twice a day, there is no such thing as a broken coat."—*Marshall.*

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* The butter being melted, a sufficiency of brimstone is stirred into it, to form an ointment of a pretty firm consistency. In application, a piece the size of a small walnut is rubbed between the hands, and these drawn along the backs of the sheep.

FOLDING.

This is a capital month for the sheep-fold, with those who still practise it. Now you may fold the cabbage and turnip-land, which are the crops that will soonest succeed the operation: the general rule for all manuring. Give each sheep a square yard in the fold, and go two nights on the same land.

THISTLE THE WHEATS.

In this month, the crops of wheat, if any thistles have arisen in them, should be weeded. The best manner of performing the work is with a small hand-hook. It should not be deferred longer than the beginning of June, or damage will be done to the crop by the treading.

DIG MARL.

This is a good season for marling land: one of the most important works that can be done in husbandry. All farmers that have marl under their fields, and do not make use of such a treasure, are to be condemned.

In some countries it is the common manure; and almost every where to be found when dug for; in such places, the farmers have nothing to do but to resolve on the undertaking: they all acknowledge the expediency of the work, and seldom dispute the great profit of it; but, in other parts, the knowledge of marl is very confined. It may, perhaps, be discovered half a century before it comes into general use. In tracts of waste land, or sheep-walks and warrens, lett at a shilling, or two shillings and sixpence an acre, marl being discovered, and rendering such land capable of yielding noble crops of turnips, clover, and all sorts of grain and pulse; the uncommon effect, and the amazing advantages made by it are so striking, that the use spreads fast. But, on the contrary, when marl is found under richer soils (enclosed countries, for instance, of ten or twelve shillings an acre), the case is different: it will not make such an improvement as on the poorer lands; and, as great fortunes are not suddenly made by the use of it, the farmers in some districts will not be persuaded to use it with any spirit, possibly, not at all: they think that a rent, comparatively higher than the other tracts, will not allow of their spending such sums about it: that they will not reap *equal* profit is undoubted; but why not accept of twenty *per cent.* advantage? Should they reject it, because they cannot command fifty? If tenants are backward in making use of marl on lands of ten or twelve shillings an acre, their landlords should set them the example, and shew that the work will answer well.

Marl is of various sorts, and lies in various strata; in some places, it is a soft, fat, soapy substance; in others, it is hard as chalk, which are called stone-marls: sometimes you find it white, sometimes grey: also blue, yellow, and a dark brown. In some counties you have shell-marl, which is composed of nothing but decayed shells. The depths at which it lies are various: sometimes only three feet from the surface; at others, ten or twelve: and in some places so deep, that it will not answer to get it at all. The strata are also of different thickness, from two feet to twelve feet deep; but the general circumstances in which all true marls agree, and which denote them to be real, is the effervescence with acids.

If it is uncertain what strata are under a farm, it is ever advisable to use the screw-borer, to discover what soils are within reach. By means of that instrument, you discover, at a trifling expence, if there be any marl at command.

The best way of conveying it on to the land, if it does not lay very deep, is to open a sloping mouth, sinking the pit gradually, wide enough for a cart to drive in and out; and, when you come to the marl, to work it away circularly, and to keep the pit ten or fifteen feet deep, by which means the expence of filling the carts will be much lessened. The expence of marling, when it is thrown in this manner into the cart, will be, upon an average, threepence to threepence-halfpenny per cubical yard, the filling and spreading; and about fourpence-halfpenny for the teams, carts, and drivers: in all, eightpence per load, or cubical yard, or three pounds six shillings and eightpence per hundred loads. This will be a proper quantity for an acre of land: the benefit will last for twenty years, and the land always be the better for it.

DIG CLAY.

Where marl is not to be had, clay, in many places, is to be found at a moderate depth. This manure has few of the properties by which marl is to be known; but yet it works wonderful improvements on many soils. In some light lands it has been preferred by many very good farmers to indifferent sorts of marl; and this preference has been the result of attentive experience.

But the great point concerning clay is not so much the comparison with marl, as the use of it where no marl is to be had. On all light sandy soils it should be used with a confidence of success; for the precedents of its good effects are so numerous, that we cannot have a doubt of its excellence. About sixty or seventy loads an acre, at the same expence as of marl, will work an improvement great enough to shew how much mistaken those men are, who think nothing but the finest marls worthy of attention; and upon heavier soils, such as wet loams, brick-earths upon clay, and loose hollow soils, that want a firmer texture, clay is an excellent manure; but there are vast tracts of such land, that cover very fine veins of clay, and yet the farmers know nothing of the use of it. It is much to be regretted that their landlords do not give them a juster idea, by being at the expence of claying some small fields, until the benefit of the improvement becomes conspicuous.

DIG CHALK.

Chalk is a manure common in many parts of the kingdom, and this month is a very proper season for digging it. A distinction is here to be made between the chalks that are of the fat soapy kind, and those hard ones that are flaky and different. The first ought always to be ranked among the marls, for such they really are; but the latter is properly chalk, and are of excellent use on many soils; they work a great improvement on light sands and light loams: they have in many places been used with great success on gravels; and on clayey loams and clays they do extremely well, mellowing them greatly, and bringing them into much better order for ploughing, and much earlier in the spring, which, on such soils, is always a matter of consequence. The expences of this improvement are the same as of marl or clay, being sometimes dug and thrown directly into carts, and at others drawn up in buckets through shafts. These variations are not of such importance as to exclude the propriety of the improvement, even in the most expensive countries.

EMPTY PONDS.

This is a proper season for emptying ponds, and cleansing rivers; for, being early in the summer, you will afterwards have an opportunity of turning the mud over, and thereby sweetening it, and laying it into the proper state for bringing on the land. This is a part of husbandry too much neglected by many farmers; but advantage should always be taken of it by a good husbandman, when he is lucky enough to succeed a great sloven; for then he will probably find all the ponds, &c. full of rich mud.

It is improbable that pond mud, especially if there is a stream into the water, should ever fail of proving a good manure, when judiciously used. The method of managing it, which has been found the most beneficial, is the following:

As soon as the mud is dry, and hard enough to spit, turn it over, and three months after, mix it with a quantity of chalk or marl: if lime is cheap and plentiful, it will be an excellent management to add about one-tenth the quantity of mud in lime. Let the whole be mixed well together, and in September turned over again, and spread upon pasture or meadow land in October.

RAPE OR COLE.

This crop is sown, when intended for sheep-feed, all through June and July; but for seed, the first week in August will do: upon fen and peat soils and bogs, and black peaty low grounds, it thrives greatly, and especially on pared and burnt land, which is the best preparation for it. In many respects the culture is the same as for turnips, only double the quantity of seed: two quarts an acre; but some sow three; and I have heard of a gallon being used.

RAPE FOR SEED.

The Flemish culture much deserves attention. They sow in a seed-bed for transplantation; setting it out on an oat-stubble, after one ploughing. This is so great and striking an improvement of our culture of the same plant, that it merits the utmost attention; for saving a whole year is an object of the first consequence. The transplanting is not performed till October, and lasts all November, if no frost; and at such a season there is no danger of the plants not succeeding: earlier would however, surely be better, to enable them to be stronger rooted, to withstand the frosts, which often destroy them; but the object of the Flemings is not to give their attention to this business till every thing that concerns wheat-sowing is over. The plants are large, and two feet long; a man makes the holes with a large dibble, like the potatoe one used on the Essex side of London, and men and women fix the plants, at 18 inches by 10 inches: some at a foot square, for which they are paid nine liv. per manco of land. The culture is so common all the way to Valenciennes, that there are pieces of two, three, and four acres of seed-bed often met with. The crop is reckoned very uncertain: sometimes it pays nothing; but, in a good year, up to 300 liv. the arpent (100 perches of 24 feet), or 8l. 15s. the English acre. They make the crop in July; and, by manuring the land, get good wheat.

SOILING.

Soiling on lucern, tares, clover, or chicory, should go on through the whole of this month. In some soils, and situations, and seasons, it may not be possible to do any thing in it in May, but now these plants will every where admit it. The mowings should be daily, and attention paid that the food be not left loaded in carts, or given in the racks or cribs in such quantities as to ferment, which presently renders it unpalatable, and consequently refused by horses and cattle, much waste ensuing. If the number to be fed be not so great as to demand a one-horse cart-load for every bait, it will be proper to have an *ass car* for this purpose, as it is very material that all which is brought home should be immediately distributed to the stock. A good farmer will have been attentive to secure as ample a provision of litter as possible; if he has not reserved his wheat-stacks to be thrashed at this season, which usually gives the best price, at the same time that it provides for littering at a season the best calculated for making dung. That summer is that season, there are several reasons for admitting.

If, on experience, it should be found by others as it has often been by myself, that litter of all kinds is converted in summer to better dung than common winter keeping can effect, the vast importance of raising amply various crops for soiling, acquires a fresh interest in the farmer's system. He will be sedulous to cover his fallows with tares, clover, and chicory, and apply a breadth of his very best land to lucern; he will ever take care to have too much rather than too little, as an increase of his haystacks can in few cases prove any evil; and as these crops prepare for corn at the same time that they furnish support for cattle, horses, and swine, when dung is best made, they tend, in every way, to keep a farm in heart.

LONG AND SHORT DUNG.

Many experiments have been made, not only by garden farmers in the vicinity of Wimbledon, but also by Mr. Paterson, comparing long fresh dung with such as is well mixed and rotten; and the result has been very generally in favour of the long dung.

DAIRY.

"I take it that oftentimes in very hot weather, the milk in a cow's udder, much agitated by driving, or running about, is in a state not very far different from that carried on in a churn, which frequently makes the great difficulty in what is called bringing the cheese, or fixing the curd in the tub or pan: I have often heard dairy-women say, that it is sometimes very difficult to make it come at all, and instead of one hour (the time very commonly given by dairy-women, in bringing the cheese) that it will frequently not come in three, four, or five hours, and then in such an imperfect state, as to be scarce capable of being confined either in the cheese-vat or press, and when released from the press, will heave, or puff up, by splitting or jointing, according as the nature or state of the curd happens to be. Whenever people find their cows in this situation, which in hot summer evenings must often happen, especially where water is scarce, or in grounds where there is very little shade; then it is, that making use of a little cold spring water before earning, or rendling, is useful, as that will make the runnet take effect and the milk coagulate much sooner. It often happens, in some dairies, that the work is quite at a stand: the dairy-woman not knowing how to hasten the coagulum, or coming of the cheese, thinks of putting more runnet in to forward it; but the nature of runnet being such as will dissolve the curd in part coagulated, if more be put in, disturbs the whole, and prevents its becoming curd at all, or in a very imperfect state, remaining in the whey, in an undigested state that will neither turn to curd or cream, and a principal part of the richest of the milk is then cast away with the whey. Cold water, with a little salt (as hereafter recommended) will, in a great measure, prevent this difficulty. One great point, or thing to be observed in first setting off, or rendling the milk, is carefully to observe the state of the milk as to heat or cold: the grand medium, or state it should be in when you put the runnet into it, is what may be properly understood milk-warm; if you find it to be warmer than that, it is recommended to put some fresh spring-water into it, in such quantity as will reduce it to the milk-warm state: a quart, two, three, four, or more, according to the quantity of milk to be so cooled: many people may think water will hurt the milk or impoverish the cheese; experience shews it will not, but is a means of the runnet more immediately striking or operating with the milk. I would recommend the use of a thermometer, to shew the degree of heat milk bears. I doubt not, one may be constructed on a very easy plan, that will cost a very little money, and it will be well worth while to be at a small charge to regulate a fault, of putting milk together too hot, which is of more ill consequence than people are aware of.—*Twamley.*

" Sometimes, if cheese be laid cool when first made, or coming from the press, is dried outwardly by means of a harsh cool air, when at the same time the inside of the cheese remains in a moist state, though the coat is hard and dry, when that cheese is exposed to heat, either by lying near a hot wall, or near tiles in hot weather, or by the immediate heat of the sun, it will be drawn up round, in the same manner, and by the same cause, that a board is made round, or coffered up, by the heat of the sun: rank cheese very often heaves, from the cause before given, that makes it rank. Cheese is very apt to split, or divide in the middle, by being salted within, especially when people spread salt across the middle of the cheese when the vat is about half filled, which curd, though in a small degree separated by salt, never closes or joins; and is much easier coffered up or drawn round than other cheese; especially thin cheese made in what we call Gloucester vats, being round or rising in the bottom, and the slider or cheese-board that is laid over it, made convex also, in order to make the cheese thinnest in the middle, that it may dry quick for early sale. Then, if salted within, and being laid soft on the shelf to dry, as it bears only on the edge all around, it is almost sure to split; and it is often seen; scarce a cheese in some dairies, of this form, but what do split. Salting a little in the milk is greatly preferable, for these dairies in particular.—*Twamley.*

"It is a fact well established, that the season has great influence on the quality of cheese; especially on the defect more immediately under notice. In 1783, a dry hot summer, scarcely any dairy could make good cheese. In some dairies more than half the make was hollow, and even in the best dairy I had an opportunity of examining, numbers were "eyey;" while in a common season, and more especially in a cool summer, the same dairy has scarcely a defective cheese.

"In North Wiltshire, an experienced, and very intelligent dairy-woman, observed, that when the "crazey" (the crow-foot) is in full blow, she finds her cheese particularly inclined to heave; while a dairy farmer of the highest class in the same district, has observed, that when the creeping trefoil white clover *(trifolium repens)* has been in full blow, and in particular abundance, he has heard the loudest complaints of the licentious disposition of the cheese. It is not probable that any one species of plants is the sole cause of the disorder. Almost every cheese has its peculiar flavour, and its different degree of acrimony. Nothing is more likely to give that almost caustic quality which some cheeses are possessed of, than the common and bulbous crowfoots: not only their flowers, but their leaves, are singularly acrid. On the other hand, there are several circumstances which render it probable that a redundancy of the creeping trefoil tends to aggravate the disorder. Dry seasons, by keeping the grass short, give it an opportunity of spreading. Manure is well known to encourage it; sometimes in a singular manner. Sheep-feeding pasture grounds produce a similar effect, partly owing perhaps to the blade grasses being kept short; and in part to the soil being meliorated by a fresh manure; and it has been observed, that a suite of cow-grounds, which have been occasionally fed hard with sheep, are very difficult to make cheese from: while a few sheep among cows may, by picking out the clover, be serviceable to the dairy."—*Marshall.*

PARE AND BURN.

The men employed in this business should be kept steadily at work throughout the whole of this month: if heavy rains impede the drying and burning, let it be remembered, that the paring may probably go on the better for it, so that whatever the weather may be, this operation, which is of such essential importance in many improvements, need not stop.

STATE OF WHEAT CROPS.

The young farmer will now be naturally led to watch the progress of his wheat crops: no accurate judgment can be formed till this month, which will enable him to make various observations which a man of any curiosity will not omit. It is remarked by a late writer, that wheat which has carried a green and flourishing countenance throughout the winter, often loses its verdure in the spring, and assumes a yellow sickly aspect. In the spring of the year 1780, the forward sown wheat was so much affected by the cold weather in the months of April and May (it having been one of the most backward springs I ever remember), as to become exceedingly yellow, and was interspersed throughout with innumerable patches of different tints, which patches, wherever they appear, are always accounted a certain and infallible prognostic of a bad crop of wheat; it having been remarked, that the fields where these patches abound, do seldom if ever recover: though it is otherwise in fields which have not these patches in them, since with kindly weather in June, the corn on these latter fields often surmounts the mischief occasioned to the blade by the vernal cold, according to the old proverb current among the farmers, and expressed in their homely lines, "I came to my wheat in May, and went right sorrowful away: I came to my wheat in June, and went away whistling a merry tune." After a dripping summer, bread corn is generally dear, as there is no weather so inimical to the wheat on the ground as wet, especially on the deep rich lands, where the largest crops are raised; and even on poor chalky soils, it is matter of doubt with me, whether a wet summer be not rather injurious than beneficial to the wheaten crop, though such moist weather may haply increase the growth of straw. But although this reasoning generally holds good, yet I have sometimes known the crops of wheat turn out very prolific after a wet summer. The year 1777 was one of the wettest that could have been remembered, and the spring had been uncommonly wet and chilly, so that the farmers, from the great abundance of straw, and from an observation of the unkindly state of the air throughout the summer, expected that their wheaten crops would turn out to bad account, and that consequently this grain would fetch an advanced price in the ensuing winter; but the event falsified their prediction, and the public were served with bread at a reasonable rate throughout the winter, the price of wheat never exceeding 42s. or 43s. per quarter. This unexpected fertility was occasioned, as I conceive, by a kindly and favourable season at the blooming time, for in this year the wheat was very backward in coming out of the hose, and during the time it remained in blossom, the weather was most favourable for that purpose, being, in truth, the only part of the summer unaccompanied with rain or wind. From these observations may be drawn the following corollary: that when the wheat hath a good blooming time, though the rest of the summer, both antecedent and succeeding this period, may have been unkindly; yet so much depends on the kindly state of the air at the blossoming season, that little danger need be apprehended to the crop from the weather in any other part of the summer. On the other hand, though the summer months may in general have been such as to promise a good crop of wheat; yet should a wet and unkindly season intervene while the corn is in bloom, the produce will not be analogous to the general state of the weather during the greater part of the summer months, but to that particular prevalence of it at the time when the wheat was in bloom, a time whereon seems to depend the future welfare of this and every other vegetable.

A series of easterly winds at the blooming season

son is often highly prejudicial to the wheaten crop: in the year 1771, the weather having been such as above described, there appeared a very capital defect in the wheat after the blooming season was past: on opening the chests of the ear, were perceived several small maggots, resembling in size and colour, the male blossoms of the wheat, and for which I at first view mistook them. These maggots lay in a cluster within the chest, and adhered closely to the nib of the seed: within some of the chests the corn had attained nearly to half its growth with these maggots preying upon its surface. On a closer inspection into the nature of this malady the succeeding year, I could clearly discern the maggots adhering to the female blossoms, and in whatever chests these maggots were found, the male blossoms, which in a kindly state of the air are suspended without the chests, and are connected to the female blossoms by very slender filaments, and by this economy, apparently convey the fructifying quality to the female blossoms, were in close contact with the latter within the chests, amongst which the maggots effect their lodgment, and, as I observed before, bear, on a superficial view, a strong resemblance to the male blossom, but on a closer inspection, are found preying on the female blossom, and covered by the male: from whence it seems reasonable to conclude, that these maggots are the produce of a small fly, which settling on the male blossom whilst it is performing its office, may there deposit its eggs, which being instantly conveyed to the nib of the seed, are succeeded by a progeny which are the maggots in question. These eggs may possibly retard the male blossoms from completing their office, and prevent their flying off, which they ought to do when the female blossoms become impregnated, and this may be the reason why the maggots are always found adhering to the male blossoms.

Of the male blossom of wheat it is to be remarked, that if by wind, or other accident, it becomes disunited from the ear, a succession of bloom still continues to supply its place, and this a second or third time, which displays the wisdom and goodness of Providence, in thus securing to us this necessary part of our aliment from the variety of accidents to which it is liable in this critical period of its vegetation ; and for this reason stormy weather at the blooming season is not of such very fatal consequence to the growing crops of wheat as many people imagine. But in a wet or clouded atmosphere, the danger is much greater ; for by this density of the air, the chests are so intimately closed as to prevent the male blossoms from escaping out of the hose, and hence ensues a corruption within the ear, which occasions, as hath been remarked, the evil mentioned.

A mild and open winter is by no means kindly for the growing crops of wheat, not only from the blade having from such weather been encouraged to push forward with too much celerity, and thus becoming winter-proud, as before remarked ; but for another reason, namely, that the weeds will be apt to spring up in great abundance, and meeting with no resistance in their growth, spread over the surface, and become a formidable enemy; and should a dripping summer succeed, the mischief accruing from a weedy crop will be still increased to a very high degree.—*Bannister.*

FLAX.

The flax crop will this month want a careful weeding by hand: it should be done with attention, not to go on to it in wet weather, and to beat it down as little as may be.

HEMP.

Some writers have recommended weeding hemp in June; but on all soils proper for this plant it is unnecessary; the crop will get the better, and destroy all weeds: if these get a-head among it, it is a sure proof that the soil has been improperly chosen.

PLANT HOLLY.

No plant makes so good a hedge as holly; if preserved with any attention in its infancy, it will in a few years be impenetrable to man or beast. It often fails, from being planted at an improper season; for there is not the least certainty of any success, except by planting about Midsummer. The plants should be from six to nine inches high, and well rooted; they should not be let into the sloping face of a bank, but on a level tablet left for that purpose, and well defended on both sides, to keep both sheep and hogs from them.

TRAVELLING.

If our young farmer has any relation, friend, or confidential bailiff, that he can trust his farm to for ten days or a fortnight, let him now take his nag for a summer tour, to view some farms in well-cultivated countries, and to introduce himself to the conversation of his intelligent brethren, from whom he will be sure to learn something useful. In this month are the sheep-shearings of his Grace the Duke of Bedford, and of Mr. Coke; he cannot do better than be present at one of them, as he will there meet with able cultivators from every part of the kingdom, and may learn where best to direct his steps, whatever may be his object: and this, let me remark, is no inconsiderable proof of the great national utility of those meetings. I have met farmers both at Woburn and at Holkham, who were in the progress of such journies, were properly and usefully inquisitive, and without doubt received no slight advantage from the knowledge thus gained. This is a good season for a journey; the corn of all sorts shews itself to advantage; the turnip season is in full operation; lucern is mowing for soiling; the marl-carts are at work; the lime-kilns active; and most of the works of a farm either in operation or effect.

LIME.

The lime-kilns ought to be in full work in this month, and there is no better time for carting and spreading it. At this period, the proper land to spread it on is the turnip fallows, which now being in full tilth, if the surface be well harrowed after receiving the manure, the union of it with the soil will be intimate ; it should be left some time before ploughing for slacking and re-imbibing the carbonic acid driven from it by the act of burning. Modern chemists are much inclined to attribute great effects to this acid in the business of vegetation ; the point is by no means fully elucidated, and does not very well accord with the very small benefit derived from lime when laid on certain poor soils ; but as there are many others on which the good effects of lime are unquestionable, and our farmer may be supposed to have satisfied himself by previous experiments, he will bestow the expence only where he is sure of a reimbursement. Where fallowing for wheat is the system pursued, lime is also spread on these fallows throughout all the summer months. A bushel to a rod is a very good dressing ; and even half the quantity, well applied, has a considerable effect. On waste lands, such as fresh drained bogs and mountainous moors, the greater the quantity, even to 500 or 600 bushels per acre, the greater is the effect, and probably the profit also.

SPRING TARES.

It is exceedingly good husbandry to sow spring tares in this month, and a quart of cole-seed over the same land, in order to have a very wholesome and nourishing food for weaned lambs in autumn. This is a practice on the South Downs in Sussex, from which great benefit is derived. The breadth of land to be thus applied, will depend on the other articles provided for the same application. The land first soiled or fed of winter tares, may be ploughed for this purpose, and thus two beneficial crops gained in one year.

BEES.

This is the principal season for swarming; a careful attention should therefore be paid to the hives, that the swarms be not lost.

HOGS.

The principal stock of swine may now be feeding in clover or chicory: but if due attention be paid to the great object of raising manure, our young farmer will supply them very amply in their yards with these plants, or with lucern or tares; but plenty of litter should be given: they will pay well for whatever attention is bestowed of this sort. The most profitable litters of the whole year are those of the sows which pig in June; every one should be carefully reared.

HOE BEANS.

The bean crops must be well attended to throughout this month, and the horse and hand-hoes kept at work. Let the young farmer remember, that this crop is his fallow for wheat, and must on no account be neglected. He has, of course, Berkshire shims of various breadths in the cutting plates, adapted to the spaces he has allowed as intervals, and also to the height of the beans, that he may use them at any time, without damage to the plants. For these operations he has nothing to fear but a very wet season, which much impedes all these necessary works; he ought therefore to make so active a use of every dry time, that he may not be forced to lose much labour in doing work twice, which is better executed at once when the weather is favourable.

WARPING.

This singular operation begins in June.

The husbandry which I am about to describe under this title, is one of the most singular improvements I have any where met with, and far exceeding any other that has been heard of. It is practised only in Lincolnshire and Yorkshire.

The water of the tides that come up the Trent, Ouze, Dun, and other rivers which empty themselves into the great estuary of the Humber, is muddy to an excess; insomuch that in summer, if a cylindrical glass, 12 or 15 inches long, be filled with it, it will presently deposit an inch and sometimes more, of what is called warp. Where it comes from, is a dispute: the Humber, at its mouth, is clear water; and no floods in the countries washed by the warp rivers bring it, but, on the contrary, do much mischief by spoiling the warp. In the very driest seasons and longest droughts, it is best and most plentiful. The improvement is perfectly simple, and consists in nothing more than letting in the tide at high-water to deposit the warp, and permitting it to run off again as the tide falls: this is the aim and effect. But to render it efficacious, the water must be at command, to keep it out and let it in at pleasure; so that there must not only be a cut or canal made to join the river, but a sluice at the mouth, to open or shut, as wanted; and that the water may be of a proper depth on the land to be warped, and also prevented flowing over contiguous lands, whether cultivated or not, banks are raised around the fields to be warped, from three or four to six or seven feet high, according to circumstances. Thus, if the tract be large, the canal which takes the water, and which, as an irrigation, might be called the grand *carrier*, may be made several miles long; it has been tried as far as four, so as to warp the lands on each side the whole way, and lateral cuts made in any direction for the same purpose; observing, however, that the effect lessens as you recede from the river; that is, it demands longer time to deposit warp enough.

But the effect is very different from that of irrigation;

gation; for it is not the water that works the effect, but the mud, so that in floods the business ceases, as also in winter; and it is not to manure the soil, but to create it. What the land is, intended to be warped, is not of the smallest consequence: a bog, clay, sand, peat, or a barn floor; all one; as the warp raises it in one summer from six to sixteen inches thick; and in hollows or low places, two, three, or four feet, so as to leave the whole piece level. Thus a soil of any depth you please is formed, which consists of mud of a vast fertility, though containing not *much* besides sand; but a sand unique. Mr. Dalton, of Knaith, on Trent, sent some to an eminent chemist, whose report was, that it contains mucilage, and a very minute portion of saline matter; a considerable one of calcareous earth: the residue is mica and sand; the latter in far the largest quantity: both in very fine particles. Here is no mention of any thing argillaceous; but from examining in the fields much warp, I am clear there must be clay in some, from its caking in small clods, and from its cleansing cloth of grease, almost like fuller's earth. A considerable warp farmer told me, that the stiffer warp was the best; but in general it has the appearance of sand, and all glitters with the micaceous particles. So much, in general, as to the effect: the culture, crops, &c. are circumstances that will best appear, with others, in the following notes, taken on the spot.

Mr. Webster, of Bankside, has made so great an improvement by warping, that it merits particular attention. His farm, of 212 acres, is all warped; and to shew the immense importance of the improvement, it would be necessary only to mention, that he gave 11l. an acre for the land, and would not now take 70l. an acre; he thinks it worth 80l. and some even 100l.: not that it would sell so high at present; yet his whole expence of sluices, cuts, banks, &c. did not exceed 2500l. or 12l. per acre; from which, however, to continue the account, 1500l. may be deducted, as a neighbour below him offers 5l. an acre for the use of his sluice and main cut, to warp 300 acres, which will reduce Mr. Webster's expence to 1000l. or about 5l. an acre. Take it, however, at the highest, 12l. and add 11l. the purchase, together 23l. an acre; if he can sell at 70l. it is 59l. per acre profit. This is prodigious, and sufficient to prove that warping exceeds all other improvements. He began only four years ago. He has warped to various depths, 18 inches, two feet, two feet and a half, &c. He has some that, before warping, was moor-land, worth only 1s. 6d. per acre, now as good as the best. Some of it would lett at 5l. for flax or potatoes; and the whole at 50s. He has 20 acres that he warped three feet deep, between the beginning of June and the end of September, and 18 acres, part of which is three feet and a half deep. He has applied it on stubbles in autumn, by way of manuring; for it should be noted, as a vast advantage in this species of improvement, that it is renewable at any time: were it possible to wear

out

out by cropping, or ill-management, a few tides will at any time restore it. As to the crops he has had, they have been very great indeed; of potatoes from 80 to 130 tubs of 36 gallons, selling the round sorts at 3s. to 3s. 6d. a tub; and kidneys at 5s. to 8s. Twenty acres warped in 1794, could not be ploughed for oats in 1795, he therefore sowed the oats on the fresh warp, and scuffled in the seed by men drawing a scuffler; eight to draw, and one to hold; the whole crop was very great: but on three acres of it measured separately, they amounted to 14 quarters one sack per acre. I little thought of finding exactly the husbandry of the Nile in England, I had before heard of clover-seed being sown in this manner on fresh warp, and succeeding greatly.

He warped 12 acres of wheat-stubble, and sowed oats in April, which produced 12 quarters an acre. Then wheat, 36 bushels an acre. His wheat is never less than 30.

Six acres of beans produced 30 loads per acre, or 90 bushels: one acre, measured to decide a wager, yielded 99 bushels. Has had 144 pods from one bean on four stalks; and Tartarian oats seven feet high. One piece warped in 1793, produced oats in 1794, six quarters an acre: white clover and hay-seeds were sown with them, mown twice the first year: the first cutting yielded three tons of hay an acre: the second one ton; and after that an immense eddish. Warp, Mr. Webster observes, brings weeds never seen here before, particularly mustard, cresses, and wild celery, with plenty of docks and thistles.

Flax, 40 to 50 stone per acre.

A sluice for warping, five feet high, and seven wide, will do for 50 acres per annum; and if the land lie near the river, for 70. Costs from 400l. to 500l.

Mr. Nicolson at Rawcliff, takes the levels first; builds a sluice; if a quarter of a mile or half a mile, 60 acres may be done the first year; the drier the season, the better. The clough, or sluice, 400l. eight feet wide, and five or six feet high: a drain 14 feet at bottom, and as much more at top, 30s. to 40s. an acre, of 28 yards: banks four to eight feet high, and expence 7s. to 20s. an acre of 28 yards. Begin at Lady-day, till Martinmas; but all depends on season; the depth will depend on circumstances. If a landlord warp, it should be deep at once; if a tenant shallow, and repeat it; as good corn will grow at six inches as six feet; at three inches great crops; the stiffer the warp, the better. Some seasons, sow corn the year after. Warp is cold, and if deep takes time: a dry year best: great seeds. Crops ought to be: beans 20 loads; oats 10 quarters; wheat 10 or 12 loads; never barley. After six years, potatoes, and goo flax: he makes it worth 40l. to 50l. an acre.

Mr. Wilson's idea of warping is very just: to exhaust the low lands in favour of the hills; then to warp six inches deep, to exhaust that to make the hills; then to warp again; and by thus doing, to keep the warp land in the highest order, and at the same time work a great improvement to all the higher grounds.

Note, by a Commissioner employed in Warping.—"Warp leaves one-eighth of an inch every tide, on an average; and these layers do not mix in an uniform mass, but remain in leaves distinct.

"If only one sluice, then only every other tide can be used, as the water must run perfectly off, that the surface may incrust; and if the canal be not empty, the tide has not the effect. At Althorpe, Mr. Bower has warped to the depth of 18 inches in a summer.

"Ten quarters an acre of oats, on raking in the seed on warp; the more salt in it the better; but one fallow in that case necessary, to lessen the effect, or it hurts vegetation."

A very great object in this husbandry of warping, is the application of it in other districts. They have much warp on all the coast from Wisbeach to Boston, &c. and though a long succession of ages has formed a large tract of warp country, called there *silt*, yet no attempts that I have heard of have been made to warp artificially there.

Any proprietor into whose hands this Calendar may fall, or even any farmer, living near a muddy river, should consider well the position of his ground, and try the amount of the subsidence of the water in a cylindrical glass jar; for a treasure may be near him, without his knowing any thing of the matter.

PLOUGH IN GREEN CROPS.

This is a sort of manuring which has many advocates and some enemies, resulting probably from their having drawn conclusions from trials on different soils and under different circumstances. The probability of success is greater when the vegetable is ploughed in at Midsummer than at Michaelmas, as the warmth of season must considerably aid the fermentation. Whatever the plant may be, whether rye, tares, or very early sown buck-wheat, it should be ploughed down with a skim-coulter plough, which is the only means of turning it so completely in as to be quite concealed from the eye; and this operation should take place at least three weeks before sowing turnips; when that seed should be very lightly harrowed in.

MOUNTAIN IMPROVEMENT.

The improver of moors and mountains should take care to employ hands enough in summer for executing all the works belonging to that season: in such situations the winter is usually very long and very severe; few works can then go on except quarrying for walls and lime, and digging drains, and in some cases only the former; a good use should therefore be made of all the summer months for paring and burning, building, walling, &c. &c.

HIRE HARVEST-MEN.

At Whitsuntide it is usual for farmers to make an agreement for their harvest: see the Calendar for August. But the young cultivator should now have it in his mind.

BURN DRY WEEDS FOR MANURE.

Our young farmer may perhaps want to be reminded, that spreading any sort of dry vegetable substance on the land, and setting fire to it previously to harrowing in, or drilling turnip-seed, is one of the most powerful manures that can be used. There are situations where fern from wastes, warrens, &c. may be collected in almost any quantity: if he has it in his power to preserve more than he wants for littering, he should save it carefully for this use. In the fens of Cambridge and Lincoln, it has been long a custom to burn oat and other stubbles (of reaped crops), and the effect resulting from it was probably the origin of a practice which I first heard of in the latter county; that of burning straw for this purpose.

It subsists on the Wolds. At Lord Yarborough's I first heard of this custom. His Lordship's tenant, Mr. Richardson, a very good and intelligent farmer, gave me the account, having long practised it with success. The quantity is about five tons an acre. At Great Lumber he straw-burnt a piece in the middle of a field preparing for turnips, and on each side of it manured with ten loads an acre of yard dung, and the burnt part was visibly superior in the crop. In another piece the same comparative trial was made in 1796, for turnips, which crop was much the best on the burnt part; and in 1797, the barley equally superior. On another farm he had at Wold Newton he did it for turnips, then barley, and laid with sainfoin; and the burnt straw was better in all those crops than yard-dung. Burning gorse in this manner returns great crops, but the expence is too high. He is clearly of opinion, that it is the warmth from the fire that has the effect, and not the ashes; for the quantity is nothing, and would blow away at one blast. It is proper to observe, that they do not value straw used in feeding cattle, at more than 4s. or 5s. per ton.

Mr. Mallis, of Lumber, is of the same opinion, and thinks four ton enough: he never knew that quantity fail for turnips.

This straw-burning husbandry I found again at Belesby. Mr. Lloyd, who, as I should observe, is an excellent farmer, thinks that it takes six tons per acre, which will last longer in its effect, and beat the dung which that straw would make, and in general lasts longer than common dunging. Keeping much cattle, he cannot practise it, but highly approves it.

In discourse at Horncastle Ordinary, on burning straw, the practice was much reprobated; yet an instance was produced that seemed to make in favour of it. Mr. Elmhurst, of Hazlethorpe, burnt twelve acres of *cole-seed* straw on eight acres of the twelve, and the effect was very great, and seen even for twenty years: he sowed wheat on it, four bushels an acre, and had five quarters: the four acres upon which nothing was burnt much the better land, yet the crops on the burnt part were by that made equal to the rest. But in another similar experiment for turnips, Mr. Rancliff observed the result, and the effect, though good, lasted only for one crop. Mr. Kirkham, who was in company, gave it as his opinion, that as cattle would not eat stubble, it might be beneficial to collect and stack that, and before turnip sowing burn it.

The Rev. Mr. Allington, of Swinop, has cut and carried gorse, and spread it on other land, and burnt it in May for a manuring for turnips; but has done it twice, and it answered very well; but, of course it is to be noted, that this is done only when it cannot be sold for faggots, which sell at 8s. per hundred; so that the expence would be 4l. an acre, as 1000 are produced per acre, and he burnt the produce of one acre upon another: the effect was great in the turnips; the barley was better for it; but he has not attended to it in the seeds, because hard stocked with sheep. He has burnt on the land for turnips, the long straw dung from the surface of the farm-yard, and he had better turnips there than where the dung was laid. This has been the case in two experiments he has made.

A general practice through the mountains of Gascony, and almost to Bayonne, is that of manuring for *raves*, a sort of turnip, with the ashes of burnt straw. I observed several fields quite black; and demanding what it was, my guide told me of this common practice here: afterwards I saw them strewing straw quickly over land, part of which had been already burnt on. They do this on a wheat-stubble; but not thinking that stubble enough is left, they add much wheat-straw, and setting fire to it, burn the weeds as well as the straw, and clean as well as manure the land. With such quantities of fern on all their extensive wastes, I asked why they did not burn that, and keep their straw?—The reply was, that fern makes much better dung than straw, so they burn the straw in preference. As soon as the operation is over, they plough the land, and harrow in rave-seed. One large field, thus treated, I saw ploughing for that crop. They both hoe and hand-weed the raves, and have them sometimes very large; many as big as a man's head. Use them for oxen.

SAINFOIN.

When the plants of sainfoin are thin on the ground, it is a very judicious practice to suffer the crop to remain the first year for seed, which will thicken the swath in the succeeding crops. The seed will probably be worth 5l. per acre; the straw is good horse-fodder; the plants are not at all damaged at present, and their number greatly increased for the future.

JULY.

FARM-YARD.

ALL, or much of the compost in the yard being carted on to the land, you may now, if you have leisure, begin to cart in the layer of turf, ditch-earth, chalk, marl, clay, or peat, upon which you are to fodder. There is no necessity of performing this work in July; but, as it may probably prove a leisure time for the teams, it is mentioned as a business that should be in hand, as a prevention for their standing still. It should be executing from this time till the end of September. As the importance of it is very great, being the source of the most material improvements on a farm, it should be resolved on early.

The management of the farm-yard must, however, depend on the system pursued relative to using dung in a long or in a rotten state. If in the latter, the layer of earth that was spread at bottom for absorbing urine and the draining of the dung, has been mixed by turning over, and may be supposed to have been carted on for turnips. But if the dung is taken fresh from the yard, the earth in that case is to be examined, as it should remain till well impregnated, and this may not have been effected at present, in which case it will be left for a longer duration and successive soiling on. Whenever it has absorbed its due portion, so that white soils, as chalk and clay marls, are become blackish, then is the time for removing them with the dung, and they will be equally beneficial.

TURNIPS.

Now is the time for hand-hoeing turnips; a work perfectly understood in many parts of the kingdom; but so much neglected in some, that it will be proper to enlarge a little on the method of performing it.

Supposing turnip-hoers to be scarce, or to demand extravagant prices, or none to be had, order some hoes to be made by your blacksmith: the iron part nine inches long, and three or four broad, neatly done and sharp: put handles five feet long in them. So provided, take your men into the field, and yourself with a hoe should accompany them: make them hoe the crop boldly, and not be afraid of cutting too many up. Direct them to strike their hoe round every plant they leave, and fix upon the most vigorous and healthy growing ones. By this means they will leave the plants twelve inches asunder; for, their hoes spreading at every cut nine inches, they cannot spoil your crop by not cutting freely. This work must be done by the day, and you must attend the men well, to see that they cut the land pretty deep, so as to kill all the weeds, and also such turnips as they strike at. In about a fortnight after, send them in again to rectify former omissions, in which time they must break all the land again with their hoes, cut up the remaining weeds, and wherever the turnips were left double, thin them. The men will be awkward at this work the first year; but, by degrees, they will be able to do it well, and by mixing new ones among them every year, the art will not be lost.

In countries where turnip-hoeing is commonly practised, the work is generally done by the piece: four shillings an acre for the first hoeing, and two shillings and sixpence, or two shillings, for the second, were common prices; but now it is in some districts five shillings or six shillings for the first hoeing, and four shillings for the second. When done by the piece, the farmer's principal attention should be to see that the work is well done; for, in all these operations, the men are extremely apt to run over their work in a slovenly manner, aiming only at making good earnings: the farmer should see that they cut up all the weeds, and leave the turnips every where single. The crop must have two hoeings, which should leave it *perfectly* clean, and the plants at regular distances.

If the turnip-hoers are not to be procured in number sufficient to execute the work soon enough, the plants should be well harrowed, which will thin and keep them from running thickly together in bunches. It is common for the men to bargain with the farmer to have a harrowing given before they hoe.

DRILLED TURNIPS.

But wherever hand-hoeing turnips is not well understood, and men for it easy to be had, the Northumberland system should, by all means, be practised. The rows on the tops of the ridges, as described last month, are hoed by women in great perfection; they should be set out in good land a foot asunder; and on weaker soils at nine inches. I have known women send in their children before them to thin the plants with their fingers, leaving them at the distance required, and follow themselves with six-inch hoes for cutting the ground, and making very good work. This is a great improvement, much deserving the attention of all farmers who live in counties where the labourers are ignorant in common turnip-hoeing, or where they are scarce, or apt to impose in the prices demanded. The crops are as good, and in the opinion of many, much better, than broad-cast ones.

SOOT TURNIPS.

In 1803, my son had a crop of turnips drilled in the Northumberland manner, which, as soon as the young plants were seen in the rows, he sooted at the rate of twenty bushels per acre, throwing the soot by hand out of a seed-lip, in a stream as near as might be along the row of plants. They escaped the fly, and were the only turnips in the neighbourhood that did so. It was a thought of his own, for he never read the following passage in Ellis: " Turnips sooted about twenty-four hours after they are up, will be entirely secured from the fly."

Practical Farmer, or Hertfordshire Husbandman, 1732, p. 86.

COLE-SEED.

This plant may be sowed through all this month, which is indeed the principal season for it. The preparation of the land is exactly the same as for turnips; and it has equal success with turnips when sown on pared and burnt land, which secures a better crop generally than any other method of manuring. Two or three, and even four quarts an acre of the seed are sown. It is not common husbandry to give it any hoeing. Upon peat soils pared and burnt (as in the fens of Cambridge and Lincoln), it is reckoned much superior to turnips for feeding and fattening sheep; and usually sells, if a good plant, at 50s. an acre. But in the hundreds of Essex, they hoe it very carefully, and mowing the crop with very strong scythes, give it to stall-fed bullocks with the greatest success: upon very rich soils, no system can well be superior to this.

COLE-SEED WHERE TURNIPS FAIL.

The first, and even second sowings of turnips, may have failed by the end of July; in this case some farmers prefer sowing cole-seed rather than turnips a third time.

CABBAGES.

The crop planted in April or May must be looked to this month. As they were both hand and horse-hoed in June, perhaps they will not want any more culture till August; but this depends on the season: if the weeds grow, let them be killed; for the best rule in this matter is, to hoe sufficiently to keep the crop perfectly clean, and to horse-hoe whenever the intervals have been bound by rains or otherwise.

The crop planted last month must be hand-hoed before the middle of this: in which work you should be attentive to cut up all the young weeds that grow near the plants, and break all the land on the tops of the ridges: but the men need not hoe the sides of them or the furrows, as the plough in horse-hoeing will cut them much better. Some fresh earth should also be drawn to each plant, earthing it up as it were. The first horse-hoeing should be given soon after; in which operation the plough should take off a furrow from the ridges on each side, and throw up a small ridge in the middle of each interval, which will let the air into the earth on which the plants stand, and pulverize and sweeten it. The cabbages will be left on a narrow slip of earth, ready for the second hand-hoeing, which will be given with great ease.

This work must, however, be done with much care and attention, for if the plants are left in too small a space, and the sun be powerful, they will suffer: the stripe of earth the plants are left in should be nine inches wide; and, if the weather is very hot, a furrow turned back again, at least on one side, as soon as may be. Afterwards the horse-hoeing should be given with the shim of three shares; one *low*, for cutting tke bottom of the furrow in the intervals, and two others, four inches higher (being drawn up at pleasure through the block), for cutting the sides of the ridges without removing too much earth from the plants. And this tool followed after a time by the double mouldboard plough, to sweep out the furrows and round up the ridges.

The cabbages drilled in April where to remain, must now be horse and hand-hoed; and in the latter work, whenever it is executed, well pulverized earth free from weeds should successively be drawn to the stalks of the plants.

WELD.

This is the season for pulling weld, which is done by women, and bound in small sheaves; these are set to dry, which takes from one week to three. It is then stacked, and is the better for a sweat. In three months it is bound in fresh sheaves, of two stones (14 lb.) each, and is then saleable, A good crop is from 15 cwt. to a ton: the price varies greatly: sometimes to 16l. and 20l. a ton; at others, 4l. or 5l.

POTATOES.

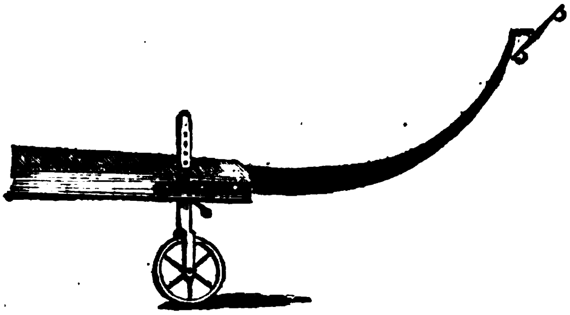
The crops of potatoes, planted in rows, must have a third horse-hoeing this month. The common way of ploughing backwards or forwards *every* time of horse-hoeing, is not well adapted to this crop; for cutting the roots, when the plants are in full growth, hurts the crop, and you destroy runners that would produce potatoes. For this reason the third horse-hoeing should be given first with the shim, which cuts and loosens the earth, without turning it over, or forming any ridge. Some of them work with many little triangular shares, some with single flat ones, and others only with coulters; but any of them that cut up fresh moulds at the bottom of the furrows, will answer the purpose. A double mould-board plough (a common instrument in some counties), should follow the shim in about a week; and, striking the furrows, throw up all the loose earth against the ridges, banking them up. There is a great use in this operation; for it throws up fresh earth for the roots to shoot into, which is preferable to taking it away from them, after they have advanced at all in growth.

CARROTS.

The carrot and parsnip crops will want a hoeing this month; which should be given while the weather is dry. These operations are never neglected, but the farmer is sure to lose a guinea for every shilling he saves.

BEANS.

The horse-hoed crops of beans must be attended to very carefully; and they are now so high, that if a horse-hoeing is given this month, it must be very carefully done. Whether the shim or double mould-board plough be used, it must be drawn by a whipple-tree as short as permits the horse to work, and hung on to a springing fixture at the beam end, in this form:



by which means the whipple is raised, that if it does brush the beans, it is so high in the stalk, that they bend easily to it without suffering damage; but the higher it is thus raised the better. I have seen them work in Kent, when men from other counties thought it impossible. In this state of the crops, the block of the shim is in a position longitudinal with the rows, otherwise the ends may break the stalks. In common, however, the only horse work wanting this month is earthing up. Weeds are never to be left, the hands and hand-hoes are ever to attack them.

LUCERN.

The lucern will be ready to cut again this month: if it was drilled for horse-hoeing, the intervals must be directly horse-hoed the contrary way to the last. In respect to hand-hoeing, the best rule will be to do it according to the growth of weeds: there is no necessity for it while the rows continue clean: the weeds that arise among the plants in the rows, should be plucked out, and particularly all grasses, which are the greatest enemies to this crop.

But if the lucern was sown according to the directions given in this Calendar, that is, either broad-cast, or in drills at nine inches, probably nothing need be done in cleaning this month; as one or two scarifyings in the year, will keep it sufficiently clean.

BURNET.

This month the crops of burnet left for seed will be fit for mowing: the seed is apt to shed, if care is not taken in mowing it. It is best thrashed in the field, like turnip or cole-seed, and the straw made into hay. It yields very great crops of seed; and some persons have asserted, that it is as good for horses as oats; but no satisfactory trials of due continuance have been made on it.

The following notes deserve attention:

My burnet, though very green and beautiful all the winter, made no great progress till the middle of April following, when I thought it absolutely necessary to feed it. I did so; but I did it too late, and kept my cattle upon it too long, from the middle of April to the 20th of May. This was a very great mistake: the burnet plants were now headed for seed, and the stock fed chiefly upon the heads, which greatly lessened my quantity of seed, as well as retarded the growth of the plants. I turned ewes, lambs, and calves into the field, and they all fed very greedily upon the burnet. From what I had heard of Mr. Rocque, I very much expected them to scour; but there was not the least appearance of it, and the cattle throve accordingly.

The 6th of July I began to mow, the weather being favourable: six men and four boys thrashed and cleared the seed in seven days. I had 200 bushels of very fine clean seed, as many sacks of chaff, and seven loads of hay, from a field of seven acres and a quarter.

Satisfied that 200 bushels of seed would be more than I should be able to dispose of, I was not anxious after another crop, being rather desirous of seeing what it would perform as a pasture. Accordingly, in about 10 or 12 days after the field was cleared, I turned seven cows, two calves, and two horses into it; they all throve very remarkably, and the cows gave more, and we thought a richer milk, than in any other pasture: I really expected, as burnet is so strong an aromatic, that the milk would have had a particular taste; but far otherwise, the milk, cream, and butter were as fine, if not finer tasted, than any from the best meadows. I am satisfied, that there is no better pasture for cows, whether milched or barren, than burnet. The weather was now extremely droughty, all our pastures were burnt up, yet the burnet flourished and grew away as if it had a shower every week.

My stock of cows, horses, and calves, before mentioned, pastured in it almost continually till Michaelmas: by the middle of November it was grown so considerably, that I have again turned in six head of cattle; and if the weather be not severe, I am of opinion it will maintain them till Christmas.

The burnet straw, or haulm, is, after the seed is separated from it, a useful fodder: the chaff is of value, if mixed with any other. I have fed all the above-mentioned stock with it promiscuously together in one field; putting the haulm into racks and the chaff into troughs, and if the haulm was chopped with an engine, it would be of still more value.

Burnet, I am fully persuaded, will prove a very great acquisition to husbandry on many accounts, but more particularly for the following reasons.

Burnet is a good winter pasture, consequently it will be of great service to the farmer, as a constant crop he may depend upon, and that without any expence of seed or tillage, after the first sowing; whereas turnips are precarious and expensive, and when they fail, as particularly this year, the farmer is very often put to great inconveniences to keep his stock.

It affords both corn and hay. Burnet seed is said to be as good as oats for horses. I know they will eat it very well; judge then the value of an acre of land which gives you at two mowings ten quarters of corn and three loads of hay.

The seed, indeed, is too valuable to be put to that use at present; though it multiplies so fast, that I doubt not but in a few years the horses will be fed with it.

It will bear pasturing with sheep.

It makes good butter.

It never blows or hoves cattle.

It will flourish upon poor light, sandy, stony, shaltery, or chalky land.

Burnet, after the first year, will weed itself, and be kept clean at little or no expence.

The cultivation of burnet is neither hazardous nor expensive: if the land be prepared, as is generally done for a crop of turnips, there is no danger of any miscarriage, and any person may be supplied with the best seed at 6d. per pound.

I make no doubt but that burnet might be sown late in the spring with oats or barley. A gentleman in my neighbourhood did so last summer, and it succeeded very well. I should think a buck-wheat season, which is sown the last of all corn, would suit it very well; but of this I have no experience, and could wish to have the experiment tried. A pea field drilled, in rows, and kept clean, would make an excellent season for burnet, as the pea crop would come off soon enough to prepare the land with two ploughings by the middle of August, after which time I should not choose to sow it.

It very frequently happens, that every farmer who sows many acres with turnips, has several worth little or nothing: the fly, the black caterpillar, the dry weather, or some unknown cause, often defeating the industry and expence of the most skilful farmer. When this happens, as it too often does, I would, by all means, advise him to sow it with burnet, and in March and April following he will have a fine pasture for his sheep and lambs.—*Communications to Dr. Templeman.*

MOW GRASS.

All meadows and pastures, not mown in June, should be cut this month. Hay-making being in many seasons such ticklish work, and so extremely expensive, the farmer should take care to manage it with as good contrivance as he can. To have plenty of hands, is a material point; for, if good use be not made of favourable days, the work will certainly be unprofitable. In order to this, the farmer should have some other work always in readiness for his people, in case the weather is too wet for hay-making. For men, he may have compost hills to turn over and mix, borders to grub or dig up, carting manure, &c. Women he may employ in stone-picking, weeding, &c. When many hands are kept, this management will save much useless expence. In the making the hay, the getting it at last on to the large cock should never be omitted.

Many farmers only run it up in broad rows, and load from them to the waggons; but it is better to employ all the hands in cocking it; for, if the cocks are large and well made, the hay will take no damage in them, even in very heavy rains; and, by all the men being so employed, much the more will be secured.

HAY.

Mr. Ducket's method of trying the heat of his hay-stacks well deserves noting. He thrusts a scaffold bolt, or other stout and long iron bolt, into it, to give an easy admission to a gun-rod, with a strong worm at the end of it, with which he screws out a sample, and discovers not only the heat, but the colour of the hay: if the stack wants air, he makes many of these holes, which give vent to the heat, and answer the purpose of a chimney. The preceding summer was so favourable for hay-making, that, according to custom, much hay was spoiled by hurrying together too quick, and many stacks fired. Experience should convince men, that there is more danger in a fine year than in a bad one.

THE TEAMS.

All this month, the horse and ox teams should be soiled daily with lucern, in the house or yards; but if in the latter, they must have water always at command, and also sheds for shelter; and if the farmer does not provide plenty of litter for treading into dung, he neglects the principal part of his profit. Lucern is the best plant for this purpose, and an acre of it will go much farther than of any thing else. Chicory is good, so is clover; and tares, mown every day, will answer well in the same use. In want of these, give natural grass; but any of them are better, with plenty of litter for dung, than turning the horses or oxen into the field.

THE FALLOWS.

Have an eye to your fallows this month, and do not follow the example of those farmers who totally neglect them for works of hay and harvest. A farmer carries on his business very unprofitably, if he does not keep men and horses enough for all works: it is unpardonable to suffer the fallows to be over-run with weeds.

A ploughing well-timed, just before harvest, is certainly of much consequence in fallowing; a work in which well-timed ploughings are of more importance than the mere number of earths given. It is necessary in such a work to suppose this business of fallowing, but the modern well-informed husbandman will, after his first year, but rarely have recourse to them.

FOLDING.

Where folding is the system, it should this month be followed with unremitted diligence: the lands usually fixed on for this purpose are the wheat-fallows, which is very judicious in those farmers who have no crop sown between the turnips and wheat; but let the attentive, accurate husbandman, lay it down as a rule, ever to fold those lands first which will be first sown. During this month, he should fold such fields as are destined for August-sown grasses, of whatever sort, or tares: if the manure is left long before sowing, the benefit reaped by the crop will not be nearly so considerable.

WEAN LAMBS.

Before this month goes out, the lambs of the flock should be weaned: in this business they are much earlier in Sussex than they are in Suffolk. Clover in blossom is, of all other food, the most forcing; sainfoin-rouen excellent; and if the farmer has neither, he ought to have made a reserve of a sweet good bite of fresh grass for them. It is essential that due provision be made before-hand.

DIG MANURES.

Do not let the marl, chalk, mud, or clay carts, stop this month; it is a very proper season for the work, and should be pursued with spirit, while the season admits it, on all soils: I say *on all soils*, because in winter, wet or heavy ones must not be carted on. These manures, though expensive at first, are cheap in the end: for they last many years. In all works of carting, attend particularly to the employment of your team; use as few horses as possible. For this purpose, the small three-wheeled cart is well adapted. One horse is sufficient for two of them; one loading by means of the third wheel, while the other is driving away; it supports the weight of the cart and load, instead of the fill-horse in large carts: they do not hold more than fifteen bushels; such will do for winter-carting on grass-lands, without poaching. If the draft is not distant, three or four men will thus be employed by one horse, which is an excellence that no other machine can boast. Now let any attentive cultivator reflect on the importance of an odd horse performing much of the carting of a farm, while the others are going regularly on with their tillage or road-work. Whoever will consider this comparison in the proper light, will be sensible that it is an economical way of carrying on business.

MADDER.

In case the season in the spring proved so unfavourable to planting madder, that the work was delayed until the last week of May, or the first of June, the fields so planted should now be horse or hand-hoed, as most wanting. The best way is to use the shim; not for turning a ridge against the rows, as the plants will yet be too weak for that operation, but merely to loosen the earth of the intervals, thereby to kill the weeds. Hand-hoeing and weeding should depend on the number of the weeds that arise among the plants. Let the cultivator of madder, through the whole process of the crop, remember, that he must be to the full as accurate as a gardener: his soil must be rendered but little inferior to a dung-hill: all weeds must be for ever eradicated; not one must injure the plants; his land must always be kept perfectly loose and well pulverized; for a crop that depends merely on the quantity of the roots, can never thrive to profit in land that is bound, or in an adhesive state.

CUT PEASE.

Forward white pease will be fit to cut early in this month. If the crop is very great, they must be hooked; but if small, or only middling, mowing will be sufficient. The stalks and leaves of pease being very succulent, they should be taken good care of in wet weather: the tufts, called wads, or heaps, should be turned, or they will receive damage. White pease should always be perfectly dry before they are housed, or they will sell but indifferently, as the brightness and plumpness of the grain are considered at market more than with hog-pease. The straw also, if well harvested, is very good fodder for all sorts of cattle and for sheep; but if it receives much wet, or if the heaps are not turned, it can be used only to litter the farm-yard with.

BARLEY.

Some of your barley will probably be ready for mowing towards the latter end of this month, particularly the Fulham sort, which is frequently cut the middle of July, a fortnight before any other sort, though sown at the same time, and on the same land. This early mowing has several advantages;

tages: many weeds are cut before they seed, which, in a fortnight longer, would shed, and consequently injure the ensuing crops. The trouble and attention of harvest is lessened; for a part, at least, of the barley crop may be in the barn, before other farmers, who do not use this sort, begin to mow.

WHEAT.

August is the principal month for cutting wheat, under which head I shall treat of it more particularly. I mention it at present, merely to consider the conduct of many sensible farmers, who are fond of cutting their wheat, at least ten days before it is ripe. There is reason to think this practice a very good one: the corn is left in the field longer than common, to finish in that manner the ripening: the advantage is the fineness of the grain. If you are desirous of carrying to market a sample of wheat that shall exceed all others, it must be thus harvested; and I have heard more than once several very attentive farmers assert, that they lose nothing in measure by this management. It is at least worthy the trial of all good husbandmen, were it only for the convenience of somewhat dividing their harvest: the last fortnight in August is so busy a time, that many of them scarcely know how to get in their corn, upon account of all sorts then requiring attention at once.

MILDEWED WHEAT.

Be very attentive to the wheat crops this month: they are every where liable to this fatal distemper, which admits but of one cure or check, and that is, reaping it as soon as it is struck. The capital managers in Suffolk know well, that every hour the wheat stands after the mildew appears, is mischievous to the crop. It should be cut, though very green, as it is found that the grain fills after it is cut, and ripens in a manner that those would not conceive who have not tried the experiment, which I have done many times; reaping so early, that the labourers pronounced I should have nothing but hen's-meat. They were always mistaken, for the sample proved good, while others, who left it longer, suffered severely. The fact is now pretty generally known and admitted.

RYE.

This grain is sure to demand cutting, perhaps early in the month, and should be prepared for accordingly.

BUCK-WHEAT.

I have known this crop succeed well and yield largely, when sown so late as the first week in this month; and it is a very valuable circumstance, that a man can have so long a period for tillage, and then raise a crop which certainly classes with ameliorating ones, and which prepares well for wheat.

PARE AND BURN.

Wherever there is an improvement going on of any extent, this work should never stop while the weather permits it to be continued. In the spring, for potatoes; then for turnips; now for cole-seed; and, when that is over, then it may go on for wheat, or on mountains for rye. An improver should not let the hands thus employed go to any other work. The stoutest and most skilful hand will not be able to pare (without the burning) more than an acre in a week, even where the work is smooth and free from impediments.

HOGS.

During this month the stock of swine way be supported on clover, chicory, and lucern; for sows that have pigs, and for weaned pigs, the early-sown lettuces on rich warm land will be ready, and prove very useful. Garden-beans planted for this purpose, are also applicable to the use of all sorts of swine. This is not a month of difficulty for this animal; and the young farmer should take care that his dairy-wash is accumulating in his cisterns for sows and weaned pigs, for a time when they may want it more than at present.

FAT OXEN.

Careful graziers make it a rule, however extensive their farms may be, to ride round and see every beast in every enclosure, at least once a day. Fences demand perpetual attention, and high-fed cattle are apt to break their bounds, if this article suffers through neglect.

Beasts that are soiled in stalls or yards, have, through all this season, plenty of food, supposing a proper succession of those crops which have been often mentioned for this use.

WARPING.

As this capital improvement, where yet known, goes on only in summer, the farmer should of course keep his works active every tide, and never lose one through neglect, or from having his sluices, &c. out of order.

MANURING NEW LAYS.

This part of the management will not be found essential if the land be laid down in the courses prescribed; it however will at all times be found very beneficial. The best time for it is in August or September, if done the first year, being then a year old, when a moderate dressing will much promote the thickening of the herbage. But upon soil's rather unfavourable to grass, on which the success is at all doubtful, I should prefer (if it can be done but once) to delay it to the period when new lays are apt to fall off, that is, in August of the third year, if fed; but if mown, immediately after clearing off the hay, which is the best time of all others for manuring grass-land.

Top-dressings of soot, sifted ashes, malt-dust, and other bodies which will wash in the first heavy rain, should be sown the end of February or beginning of March.

SHUT UP ROUEN.

There is scarcely a more important object in the range of common farming management, than that of converting rouen, after-grass, after-math, whatever it may be called, to the greatest profit. If it be consumed in the general manner, by feeding soon after the fields are cleared of hay, or in the autumn, the value is small, rarely amounting to more (except in watered meadows) than from 7s. 6d. to 15s. an acre; and the reason of this low value is, that food is usually plentiful at this season; but kept for ewes and lambs, and other stock, in the very depth of the winter, and in spring, when food is scarce, and if turnips fail, greatly so, it is of such a value, that whoever once makes the trial of it will never fail to value it highly. By all means let the young farmer make as large a reserve as he can possibly spare, for when his neighbours in spring are much distressed for want of food, and perhaps hundreds of sheep and lambs dying around him, his will be well fed, and himself, in this respect, on velvet.

AUGUST.

HARVEST-MEN.

THE agreements with harvest-men, in various parts of the kingdom, are extremely different, and even in the same place there are many variations, some farmers pursuing one method, and some another. A common way in certain districts, is to agree with the men for all, by the acre; to reap or mow, turn, shock, make, cart, stack or barn, drive, &c. &c.; to do all the business of the harvest, in short, at so much per acre; this is a very good way; but it requires a man to be almost as watchful as day-work; for a very strict eye should be had to the *manner* in which every thing is done; that the men do not cut the corn at improper times; that they take proper care to turn it after rain, and to get it perfectly dry into the barn. A pretty sharp attention will be requisite to these points, and many others. On the other hand, when the work is done by the day, month, or week, it requires constant attention, early and late, to see that the men work their hours; and that upon *carrying*, in dubious weather, they work as long as they can see, unless the dews are heavy; for it is a maxim in most countries, that men are not to talk of *hours* in harvest, but to do whatever they are ordered.

In many counties, it is the custom to board the harvest-men, and in some they are fed at an extravagant rate: I would by all means advise the economical farmer to vary this matter, if possible, unless the men really work at a great rate, and stick to it early and late; but, if the custom is rooted so deeply that they will not give it up, then it is an object of attention to make the expence as moderate as possible, which must be by a previous plan of fatting a beast or two, and a few sheep, for the purpose; and also by providing whatever else may be consumed.

For many years, that is to say, till the scarcities, I put out my harvests to the men at 15 acres per man, and 4s. per acre for spring-corn, and 5s. per acre for wheat, beans, and pease; three bushels of malt per man, instead of beer, and from 5s. to 7s. 6d. per man, in lieu of *earnest*, dinner, gloves, and *hawky*, or harvest-home supper; at which rates the whole harvest came to about 3l. 10s. per man: it rose to 5l. 5l. and then even to 6l. and 7l. 7s. a man; so that at present, in some parts of Suffolk, the expence is not less than 10s. 6d. an acre, every branch of labour included. And this is much lower than it is in some counties. In the fens of Lincoln and Cambridge, where cottage-building has by no means kept pace with improvements, I have known 10s. 6d. a day, and ten pints and a half of ale, given; and 27s. per acre for reaping oats. There the strangers who go to assist in the harvest, will lett themselves only for the day; they are found at four o'clock in the morning on certain bridges, and the bargain is made for the day, accordng to weather and competition. As the price of labour, in common with other expences of farming, must eventually regulate the rent, landlords are blind to their interest in not building cottages: unite this with the baneful custom of not giving leases, which prevents farmers building, and the folly must be seen in its true colours. In order to bring the harvest business together, I have treated this matter here, but the young farmer is to remember that the harvest bargain is usually made long before this time: Whitsun-Tuesday is the common day for it in Suffolk.

WHEAT HARVEST.

Now is the time that the farmer gives the first of his attention to that golden crop, WHEAT. Having been a year at least, perhaps a year and a half, or two years, in gaining it, he is now anxious to get it safe within his barn. Bad weather now greatly injures his profit: he must have many hands at work to make the best use of fine seasons, or he will gain the name of an *afternoon farmer*.

There are two ways of cutting wheat, reaping and mowing: the first is the common practice, used time immemorial, and by far the better.

The low reaping called *bagging* is preferable to mowing; they cut thus near London nearly as low as the scythe.

Reaping is a work often put out by the acre to the men, and it may be done as well so as most works; but it is necessary to observe, that they do not cut or bind in improper weather, and that they make the sheaves no larger than proportioned to the quantity of weeds, and the ripeness of the corn. In the forming them into shocks or stacks, there is, in some counties, an art of making them in such a manner that they shoot off the water, and are kept tolerably dry in wet weather, without being laid so close, as not to dry with the sun and wind: it is a good practice, and deserves imitation. I have, on another occasion, mentioned the practice of covering the shocks of wheat-sheaves between Sandwich and Dover with cloths and mats. Mr. Boys informs me that mats are more commonly used, and that the practice is found to improve the sample of wheat, so that the Dover bakers give a clear preference to corn thus treated. The mats cost 7d. each. Some farmers leave their corn standing so long, that it is ripe enough to *cut and carry*, as they call it: that is, they cart home the sheaves as soon as they are bound: but this will only do for very clean crops.

In a farm-yard where there are teams enough, carting the wheat crops requires three waggons: one loading in the field, one unloading, and one upon the road going backwards and forwards: five or six horses are sufficient for them, and two men to pitch, two to load, one to drive, and two to unload; in all seven: which make good dispatch.

But the use of one-horse carts is very superior; whatever the number of horses, let each be in a well-formed cart, and much more ground will be cleared than the waggons can effect.

In some counties, it is common to stack all the wheat, if they stack any thing; and they are certainly right in the practice. No rats can get into a stack if it is built on a floor, raised on posts, in the common manner; and, wheat, being in sheaves, admits the butt ends of the straw all to be laid outwards, so that the grain is defended from every injury from external attack: whereas any corn that is not bound up, is subject to some little damage. Wheat is also found to carry a finer countenance out of a stack than a barn: the admission of the air gives it a brighter colour. In getting a stack into the barn for thrashing, difficulties sometimes arise: a whole one should be got in at once, it being very dangerous to leave a broken stack exposed all night. It must also be done in dry weather, which in winter the farmer may wait for in vain some days, and thereby find inconvenience. Some of these evils would be remedied, and at all times a great expence saved, if a window were cut in the side or end of the barn, and the stack built against it, near enough to lay some short planks from one to the other, and so do the whole by hand, throwing from the stack at once into the barn. These are points that should be considered at harvest, when the stacks are built.

Mr. Bannister has the following remark: "As a wet harvest proves so inimical to wheat, it should seem a piece of good husbandry to suffer the crop to stand till it be fully ripened, both in straw and berry, that there may be required the less portion of time to leave it abroad after it be cut; and, if barley be not mown till it has attained this utmost degree of maturity, and is not greatly encumbered with weeds or grass, the swarths may be immediately forked up after the scythe, and carried straight into the barn. It is by no means prudent to fork or rake a greater number of shocks in a day than can be conveniently housed before night, as the shocks will be sooner injured by the rain, than the corn which lies in the state wherein the scythe had left it: neither is it convenient to pursue the mowing of the several fields of this grain in too quick succession, lest a glut of rain should ensue, which might prevent the housing of it for a week, or perhaps longer, which would not only render the barley of an ill colour, but cause great part of it to spear, besides reducing the value of the straw; whereas in its pristine state it will take little damage whilst it remains upright, but when much lodged, a succession of wet weather will promote the growth of those ears which may come in contact with the earth. A lodged crop of barley, therefore, ought to be mown in the first dry time, when the berry hath attained its full growth.

"The consideration of the great damage which may accrue to this grain in a wet harvest, ought to be a further inducement with the farmer to sow early, for such forward sowing will *(cæteris paribus)* proceed with greater celerity towards ripening,

ing, than that which was sown at a later period; which will finally prove a great advantage, because, if rain should happen to that corn which is harvested at the beginning or towards the middle of August, the days being then long, and the weather hot, a short time suffices for drying up the humidity; whereas in a wet season, so late as the month of September, the power of the sun is more feeble, and the length of the days are considerably diminished, besides the far greater likelihood of a fair harvest in August than in September. when the sun advances towards the equinox, at which time there very often ensues a glut of rain.

"Of all other grain, oats take the least damage in a wet harvest. On the contrary, a shower or two is rather beneficial to them whilst they lie in the swarth, as the grain is thereby not only improved in weight and size, but the straw disposed more easily to part with its contents, and much labour is saved to the thrasher: so that the farmer generally wishes to see his oats once thoroughly soaked before they are carried home; nay, in case of necessity, this grain may be housed in a wet day; and when other corn would be totally spoiled by being brought to the barn in a showery time, the oat will receive no injury from this circumstance."
—*Bannister.*

STACKS FOR THRASHING-MILL.

The invention of this excellent machine has not been attended with one half of the advantages which might have flowed from so useful a discovery, for want of combining the use of it with the various connected circumstances of the farm-yard. This business of stacking corn, for instance, must receive an entirely new arrangement in consequence of building a thrashing-mill. By means of no other additional expence than that of an iron rail-way, and placing the stacks on frames resting on block-wheels two feet diameter, a very considerable annual expence in labour is saved in carting stacks to the barns, in loss of corn, and in waiting for weather, as well as in the saving of thrashing by flails, and all the attendant evils of pilfering and leaving corn in the straw. This is a material object, which cannot receive too much attention from both landlord and tenant.

BARLEY, &c. HARVEST.

The barley crops should generally have good field room, laying five or six days after mowing: they will improve, and, if a heavy shower of rain comes, it will not diminish the farmer's profit: it will make the grain swell, and measure more per acre: for maltsters reckon much on their profit, in such dry harvests that the barleys receive no rain after they are mown. But ever observe, that barley, oats, &c. be quite dry when you cart them: corn is always greatly damaged from being carried in damp or moist: a heat is contracted in the mow, the grain much discoloured, and the straw spoiled. This, however is much more the case with barley than with oats. While barley lays on the swath, if much rain comes, it is apt to sprout. In the wet harvest of 1801, this crop in Norfolk presented a most melancholy spectacle; three or four wet and very warm days made it grow to such a degree, that when the swaths came to be turned, they looked as if feathers had been strewed along every swath. Many thousand acres were thus damaged: those farmers escaped best who *lifted* the swaths before they were dry enough to turn; they raised them lightly from the ground with forks to let air in; a practice worth recommending. After the fields are cleared, they are raked with an instrument generally called a *dew-rake,* from its being used in the dew of the morning: a man draws it by a broad leather strap. This is a bad contrivance; the work goes on slowly, and, being hard, the men often neglect doing it well, and much corn is left in the field. Instead of it, there is in some counties a machine, called a *horse-rake:* a rake ten or twelve feet long, drawn by one horse. This machine expedites the work greatly, at the same time that it does it much better. The use of it should be universal; for one will work against twenty men, as I have experienced; and the price is not above five guineas and a half complete.

Barley and oats in some countries are reaped: an excellent custom where they cut low enough; for it is not with these as with wheat, which yields a crop of stubble; if reaped with spring-corn, what is left in the field is lost to the farm-yard. But by reaping, some of the evil of a wet harvest is remedied, provided the sheaves be made small enough.

BUCK-WHEAT.

This is a difficult crop to harvest; for the least improper treatment makes it shed the seed in the field, to the great loss in product: if ripe, it should be mown only in the dew, and left to dry in the field; and, if it stood but a few days too long, it must also be carted in the dew, or it will shed in carting. The grain being black, the colour of the sample is not a matter of consequence.

It is only the very early sown crops, however, that can be ready in any part of this month; it is not commonly ripe till the end of September or beginning of October.

PEASE.

All strong crops of hog-pease must be hooked, and not mown, and care should be taken to turn the heaps after rain; for the stalks and leaves are so succulent, that the straw will presently spoil if it is neglected. If they are stacked, great care must be taken to thatch the rick immediately, and to do it perfectly well; for a little wet getting in will be of great damage to the pease.

BEANS.

Beans are always reaped and bound in sheaves, like wheat, and being generally late in harvest, and extremely succulent, they require being left a good while in the field; and for the same reason, they should be tied in small sheaves. In binding, there are variations: the bands are made in some places of wheat straw; in others of yarn twine, which will last two years, if the thrashers are careful to save them. Beans do well in a stack.

TURNIP AND RAPE SEED.

Crops of turnip-seed, and rape or cole-seed, are extremely various, uncertain, and subject to many misfortunes; they must be conducted with great spirit, or the loss will probably not be small. The principal point is to make good use of fine weather; for, as they must be thrashed as fast as reaped, or at least without being housed or stacked, like other crops, they require a greater number of hands, in proportion to the land, than any other part of husbandry. The reaping is very delicate work: for, if the men are not careful, they will shed much of the seed. Moving it to the thrashing-floor is another work that requires attention: the best way is to make little waggons on four wheels, with poles, and cloths strained over them: the diameter of the wheels about two feet; the cloth-body five feet wide, six long, and two deep, and drawn by one horse; the whole expence not more than 30s. or 40s. I have, in large farms, seen several of these at work in a field. The turnip or rape is lifted from the ground gently, and dropt at once into these machines, without any loss; they carry it to the thrashers, who keep hard at work, being supplied from the waggons, as fast as they come, by one set of men, and their straw moved off the floor by another set; and, many hands of all sorts being employed, a great breadth of land is finished in a day. All is stopped by rain, and the crop perhaps damaged; it is therefore of very great consequence to throw in as many people as possible, men, women, and boys, to make the greatest use of fine weather.

SOW RAPE.

The seed, when intended for a crop to reap, should be sown the beginning of this month, or the end of July. The preparation is the same as that for turnips.

GLEANING.

The custom of gleaning is universal, and very ancient: in this country, however, the poor have no right to glean but by the permission of the farmer; but the custom is so old and common, that it is scarcely ever broken through. It much behoves the farmer, in some places, where it is carried on to excess, to make rules for the gleaners, and not suffer them to be broken, under any pretence whatever.

The abuse of gleaning, in many places, is so great, as deservedly to be ranked among the farmer's evils: the poor glean among the sheaves, and too often *from* them, in so notorious a manner, that complaints of it are innumerable. Make it therefore a law, that no gleaner shall enter a wheat field until it is quite cleared of the crop: this is the practice in many places, and great advantages are found from it. But, upon this plan, always desist from turning any cattle into the field until the poor have gleaned it; for, if a use is made of keeping them out while sheaves are there, merely for an opportunity of turning hogs and other cattle in, it is double-dealing, and a meanness unpardonable.

FARM-YARD.

At the leisure time of harvest, such as the wet days, when the team cannot carry corn, and while all the harvest-men are employed in reaping and mowing, if the works of tillage do not require attendance, let the horses and oxen be kept to earth-cart, to form the bottom layer in the farm-yard, carrying peat, marl, chalk, turf, ditch-earth, or pond-mud: the quantity in proportion to that of the dung which you expect will be raised.

TURNIPS.

The second hand-hoeing of the broad-cast turnip crops must be given some time this month, nor should it ever be omitted on account of works of harvest. In counties where turnip-hoeing is a common business, there is no difficulty in this, as men enough are always to be had. In some places, many make it their business to hoe all harvest through, earning more at it than by other field-work. But in counties where hoers are scarce, a farmer should always consider his turnip crops when he agrees with his harvest-men, and hire a sufficiency to set them to hoeing as regularly, when the turnips want it, as to reaping when the wheat is ready.

Look well to your drilled crops: both the horse and hand-hoeings must be given whenever weeds arise, or the land seems to be growing adhesive.

WHEAT AMONGST TURNIPS.

Mr. Walker, a considerable farmer at Harpley, in Norfolk, invented and executed on a large scale, one of the most singular practices that I have met with—that of hoeing in wheat-seed at the second hoeing of his turnips on sand land. The wheat got up well, and was not damaged by the sheep feeding the turnips, but, on the contrary, if fed in a dry season, and not too late, improved: by this method he got crops of three-quarters an acre, without the expence of a shilling in tillage. I viewed some of them with much pleasure. A singular idea, that may be applicable with great profit on certain soils and in certain cases. He practised it so extensively, as to lessen the number of his horses in consequence of it.

CABBAGES.

The beginning of this month, the second horse-hoeing should be given to the Midsummer planted crop of cabbages: the earth thrown into a ridge, in the middle of each interval, by the first, should now be split by the double mould-board plough, and thrown half to one row, and half to the other: this earth, which has been some time exposed to the weather, will be in fine order for the young fibres of roots to spread in; nor should it be stirred by the succeeding operations; for the cabbage is a plant of such a luxuriant growth, that the roots have power to follow the well pulverized land thus thrown up; and the cabbages will certainly be of a size proportioned to the quantity of food the roots command. Care should also be taken to keep the tops of the ridges perfectly clean from weeds by the hand-hoe: none should be suffered to grow; for on this part of the management much depends.

SOW CABBAGE-SEED.

This is the season of sowing for those crops that are transplanted in April. Plough a piece of well-fallowed land until it is as fine as a garden; then manure it amply with very rotten dung, and turning it in, harrow in the seed; a pound of seed to every three acres of the intended crop.

But a preparation superior to ploughing and dunging, is that of paring and burning a thin coat for plenty of ashes, and adding a thin dressing of very rotten dung; turn them in together, and roll in the seed and bush-harrow. The plants thus escape the fly and slug.

Having on former occasions mentioned the great importance of this crop, the less is necessary at present; still, however, I must urge our young farmer to determine to have as many August-sown cabbages as he can want for cattle, sheep, and swine, from the first of October to the last of December. The size they come to is superior to spring-sown plants, but they will not, in general, last longer than December. The use is however so great; so exceedingly valuable for autumnal fatting of oxen, feeding cows, fatting wethers, feeding hoggit lambs, and supporting the whole herd of swine, that one may, without hazard, assert, the farmer who does not make a provision of them, to be negligent in a very material point of his business. I beg leave to refer the reader to my *Northern* and *Eastern Tours,* and to very many registers in the *Annals of Agriculture,* for abundant information on this subject.

DRILLED CABBAGE-SEED.

Cabbage-seed may be drilled on ridges where it is to remain the last week in this month, or the beginning of September, as directed in the Calendar for April; but the reader is to observe, that the benefit of the practice has not that superiority which attends the April drillings, by which a transplantation in June is avoided. When the seed is sown in August, that operation takes place in a much safer season.

POTATOES.

The potatoe crops in rows must be hand-weeded, if necessary; but it is now probably too late to horse-hoe. If the intervals are weedy, or bound at all, or the plants not sufficiently earthed up, run the shim through them, but with much care, which will cut up weeds, and loosen the earth: after which the double mould-board will strike them clean, and throw the earth against the rows, banking them up: the running roots and fibres will follow such new thrown up earth, and increase the crop.

LUCERN.

The lucern will be ready again for cutting: if unfortunately, you have any drilled with too wide intervals, attend well to the state of the land, and take care to keep it in loose, well-pulverized order, and perfectly clean from weeds. But with crops put in as they ought to be, that is, broad-cast, or the rows at nine inches, nothing will be wanted of this sort.

SAINFOIN.

It will be now time to turn into the sainfoin fields that were mown in June; but you should be cautious of feeding it with all sorts of cattle indiscriminately. Sheep, if kept too long on it, bite out the heart by eating into the bulb.

DIG MANURES.

This is a work which should never stop for hay, harvest, or any thing else, if the farmer has money in his pocket, and his plan is thus to improve his farm; the sooner the work is done, the longer he has the benefit.

FOLDING.

If this practice be pursued, the fold should never stop in this month: the flock will bear it. Remember the general rule, of folding the land that will be first sown.

HOGS.

This is the common month for the sows to bring their second litter of pigs; and, if the farmer has not had the forecast to provide plenty of wash in his hog-cisterns, he will find the disadvantage. Clover will not do for sows and pigs; they must be fed on the skim-milk, butter-milk, and cheese-whey, that have been collecting through the preceding months, while the dairy was at its height; bran, pollard, barley, buck-wheat, or pease ground into meal, and small quantities mixed in it.

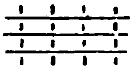
Lettuces now come into use, and are of excellent service to the sows and pigs; and may be deemed necessary if the dairy is small; and in every event to tend to saving corn. He who keeps many swine cannot be too attentive to providing such articles of food as shall save corn-feeding. Hogs are reckoned, when kept in great numbers, an unprofitable stock; but it is merely for want of making a due provision of crops for them; a few acres of each sort will carry a great herd of swine: but let no gap occur between the finishing one crop and beginning another.

CARROTS.

About the latter end of this month the carrot crop should be examined. It will require a slight hoeing, not an expensive one; but just to cut up the few weeds that may be supposed to have arisen since the last hoeing. If the former hoeings have been well performed, only a hand-weeding will do. All the plants that run to seed to be carefully removed.

PULL HEMP.

The time of pulling is about the beginning of August, or, more properly speaking, 13 weeks from the time of sowing: the leaves turning yellow, and the stalks white, are signs of its maturity: the male and female hemp are pulled together; indeed, when the crop is thick, it is impossible to separate them. The expence of pulling is generally estimated at 1s. per peck, according to the quantity originally sown.

When it is all taken up, and bound in small bundles, with bands at each end, to such a bigness as you can grasp with both hands, it is conveyed to a pond of standing water (if a clay-pit the better), where it is laid bundle upon bundle, direct and across, thus,  This is termed a bed of hemp, and after it is piled to such a thickness as to answer the depth of the water (which cannot be too deep*), it is loaded with blocks and logs of wood, until all of it is totally immersed; after remaining in this state four or five days, as the weather shall direct, it is taken out, and carried to a field of aftermath, or of any other grass that is clean and free from cattle: the bundles being untied, it is spread out thin, stalk by stalk; in this state it must be turned every other day, especially in moist weather, lest the worms should injure it. Thus it remains for six weeks or more; then it is gathered together, tied in large bundles, and kept dry† in a house till December or January.

In the fens, the male and female, or femble and seed-hemp, are frequently separated. This may arise from their hemp being coarser, and the stalks larger. To attempt it, says a manufacturer, in Suffolk, would be, I think, unprofitable, if not impracticable.

Hemp, when left for seed, is seldom water-retted, from the additional trouble and expence; but it would be better if so done. It is generally

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[*] This deserves experimental inquiry: watering hemp is a partial rotting through fermentation: the vicinity of the atmosphere must, for that purpose, be necessary. The best hemp-ponds I have seen have not exceeded the depth of five feet.

[†] It might do as well stacked, if kept perfectly dry.

stacked and covered during the winter, and is spread upon meadow-land in January or February. If the season suit (particularly when covered with snow) it will come to a good colour, and make strong coarse cloths. It is much inferior to hemp pulled in proper time, and water-retted.

PULL FLAX.

This also is the season for pulling flax: it is bound in small sheafs, and conveyed to the steeping-pit, where it remains about ten days on an average, and is then grassed. To name the time of the chief works on this crop is sufficient: flax *draws* the land, and returns no more to it than hemp. I cannot advise the young farmer to have any thing to do with it. If, from singular circumstances, he is inclined to try it, he should procure a man accustomed both to the culture and dressing.

SET STOCK LAMBS.

Fairs for the sale of lambs in several sheep districts take place in August; and it is, upon the whole, as proper a season as any other, when the whole are collected, to draw into different parcels, is a convenient moment for separating that portion which is meant to be kept for the farmer's own use. The common management of a flock is to sell a certain number of crones every year, and to keep that number of the very best ewe lambs to supply their place in the flock; and, in making this selection, the farmer or his shepherd usually (whatever the breed may be) rejects all that manifest any departure from certain signs of the true breed: thus, in a Norfolk flock, a white leg, and a face not of a hue sufficiently dark, would be excluded, however well formed: in the same manner, a white face on the South Downs; in Wiltshire a black face would be an exclusion, or a horn that does not fall back; in Dorsetshire, a horn that does not project, &c. &c.; and where the produce is annually sold lean, there is reason in all this; for customers who have been used to, and prefer certain breeds, as having paid them well, are apt to be fastidious when they purchase. Some farmers, in this selection, look chiefly at size, always keeping the largest frames; but this is probably erroneous, unless they *keep* very high. It connects with a question by no means ascertained, whether sheep do or do not eat a quantity of food proportioned to their weight? In general, it is a safer rule to choose a well-formed lamb, or that indicates the probability of making a well-formed ewe, rather than to select for size. The attention that is to be paid to wool, in the breeds that produce the carding sort, will depend on the price to be received: if the farmer lives in a district where the price of the year is given equally to all flocks, there is little encouragement to lessen quantity for the sake of quality; retaining, however, in idea, the fact that both are attainable, that it is very common to see coarse *breeched* sheep with light fleeces; and those of a fine quality heavy in weight. The Spanish fleeces, which are finer than any other, are heavier than those of our finest woolled sheep. With combing-wool, the importance of the fleece depends still more on price; we have seen it 8s. a tod: and it has lately been 36s. Quality is of very little consequence, indeed, compared with quantity, and when wool sells high, no prudent breeder will set his stock without being governed considerably by this object.

The high prices at which new Leicester, and new South Down rams lett and sell, has opened a field of speculation in sheep-breeding. It is sufficient to remark, that this spirit of breeding, whether it shall prove durable or not; whether much money shall or shall not be made in it in future, is not what any prudent man beginning business will adventure in but with great caution: men of such immense fortune are now taking a lead in it, and are in many respects doing it on such liberal principles, that the wisest conduct of such farmers as I may be supposed to address, is to take proper opportunities of converting their experiments to their own (the farmers) profit. Leave the expence to them, but when you can, convert the profit to your own advantage. In setting a stock of lambs, therefore, you may mark a score of the best, for a future ram to be picked up when opportunity offers; or, better still, to send to the tup of some ram-letter that takes them in at a reasonable price per head. By every year selecting five or six per cent. and by every year covering that number by a ram better than any of your own, the flock must be on the improving hand; and this may be done at a very small expence.

This moment of setting the stock lambs is, that of adding to, or diminishing the number of a flock, by keeping more or fewer than the crones sold. This is a very material part of the business: on a farm with a given stationary sheep-walk, it is probably regulated by circumstances that rarely change; but on enclosed farms, where the sheep are supported by fields alternately in grass and tillage, variations may easily be supposed, and the question of hard or light stocking, that is, of close feeding or a head of grass, then comes in to decide the number kept. If the produce or profit per head is looked to, the conduct to be pursued is evidently to stock lightly; but if the return is looked for in corn, from fields laid down for refreshment by rest, then close feeding is a very material point, and the number kept will depend on it. With all the grasses, &c. that do not decline from age, the more sheep you keep, the more you may keep, and the more corn you will reap when such are ploughed; a circumstance too important to be forgotten. But the young farmer will remember, that upon this system he must not have a *show* flock, or let *the vanity of a farm* have the least influence with him; if in this way he will have something to talk of, a score or two of pampered favourites, the fewer the better, will be provision enough, for they may cost him more than they are worth.

SELL LAMBS.

Having set his own stock, he drives the rest of the ewe lambs and all the wethers to the lamb fair; and it will be satisfactory to him, in ascertaining comparative prices, as well as for knowing the progressive state of his flock, to weigh and register the weights of all. Let him also acquaint himself by proper inquiries among his neighbours, of the expences which ought to be incurred in driving, hiring grass or stubbles, shepherd and assistants, board, hurdles, &c. &c.

If the fairs for the sale of lambs are later than August, as in September, and even to Michaelmas, as in some districts, great care must be taken to keep them in forcing food, as in spring tares, early sown rape, good grass of the right degree of bite, &c. &c. in order to promote their growth and increase their value. But to sell in August is more beneficial.

KEEPING ROUND.

This term is not very expressive of its meaning, but common among farmers, for describing a different sheep system, that of so proportioning the number of ewes, as to keep all their produce for the butcher. If he is in this system, his principal object is to consider wether lambs as fatting stock, and feed them accordingly from weaning to the knife. His crones the same from this period.

LAYING DOWN LAND TO GRASS.

This is the best season of the whole year for this very important preparation, and no other admissible for it on strong, wet, or heavy soils. Spring sowings with corn may succeed, and do often, but that they are hazardous I know from forty years experience. In all my trials, I never failed with an August sowing but once, and that was with crested dog's-tail gathered too early by the women, knowing the intention too soon.

Preparation.—I suppose this to have been either a fallow or winter tares sown very early, and mown in June for soiling, which may give nearly two months in the very heat of the summer for tillage: such a preparation is one of the most effective for cleaning land that can be; and it may further be supposed, that the land had been favoured in the course of crops previously to the year of laying down.

Seeds.—These should be varied according to the soil, as in the following table:

Clay.	*Loam.*	*Sand.*	*Chalk.*	*Peat.*
Cow-grass.	White clover.	White clover.	Yarrow.	White clover.
Cock's-foot.	Ray.	Ray.	Burnet.	Dog's-tail.
Dog's-tail.	York-white.	York-white.	Trefoil.	Cock's-foot.
Fescue.	Fescue.	Yarrow.	White clover.	Rib.
Fox-tail.	Fox-tail.	Burnet.	Sainfoin.	York-white.
Oat-grass.	Dog's-tail.	Trefoil.		Ray.
Trefoil.	Poa.	Rib.		Fox-tail.
York-white.	Timothy.			Fescue.
Timothy.	Yarrow.			Timothy.
	Lucern.			

In regard to the quantities per acre of these plants, this must necessarily depend on the means of getting them. In situations where women and children are fully employed, it may be difficult to procure large quantities, gathered by hand: in such places a man must be content with what can be bought. *Crested dog's-tail* is so very generally to be thus procured, that I cannot but suppose it, in a good measure at command. However, without adverting to this point, I may remark, that from the lands which I have laid down to grass to a considerable extent, and in which I have used every one of these plants largely, except the poa, and that on a smaller scale, I am inclined to think that the following quantities may be safely recommended:

Clay.

Seeds.		*Substitutes.*
Cow-grass, ...	5 lb.	
Trefoil, ...	5 lb.	
Dog's-tail, ...	10 lb.	Yorkshire white, 2 bush.
Fescue, ...	1 bush.	Timothy, ... 4 lb.
Fox-tail, ...	1 do.	Do. 4 lb.; or, York-white, 1 bush.

Loam.

White clover, ...	5 lb.	
Dog's-tail, ...	10 lb.	Ray, 1 peck; Rib-grass, 4 lb.
Ray, ...	1 peck.	
Fescue, ...	3 do.	Yorkshire white.
Fox-tail, ...	3 do.	Timothy, 4 lb.
Yarrow, ...	2 do.	Cow-grass, 5 lb.

Sand.

White clover, ...	7 lb.
Trefoil, ...	5 lb.
Burnet, ...	6 lb.

Ray,

Seeds.		*Substitutes.*
Ray, ...	1 peck.	
Yarrow, ...	1 bush.	Ray, 1 peck; Rib. 4 lb.

Chalk.

Burnet, ...	10lb.	
Trefoil, ...	5 lb.	
White clover, ...	5 lb.	
Yarrow, ...	1 bush.	Ray, 1 bush.

Peat.

White clover, ...	10lb.	
Dog's-tail, ...	10lb.	York white, 6 pecks.
Ray, ...	1 peck.	
Fox-tail, ...	2 do.	Rib, 5 lb.
Fescue, ...	2 do.	Cow-grass, 4lb.
Timothy, ...	1 do.	

But here I must observe generally, that if the land thus laid to grass, be intended for sheep, it is not an object of very great consequence to sow only the finer grasses; as close feeding, after the first year, will make any grass named in these lists fine, and sweet, and productive; but this effect depends altogether on its being constantly fed close; that is, all seed stems being prevented from rising. Every good farmer is sensible of the necessity of this with *ray-grass*; but most unaccountably does not extend a similar concern to other grasses. I have laid down above 200 acres chiefly for sheep; and I have stocked the fields so early in spring, and so thickly, as just to keep down the seed stems: the *cock's-foot, oat-grass*, and

Yorkshire white, with this management, have proved sweet feeding grasses, not at all rejected, even in fields where the flock had a choice.

Sowing.—The even distribution of the seeds being of much importance, a calm day should be chosen for the sowing, and particular attention given to prevent the seedsmen mixing too many together: let the farmer remember, that the expence of going often over the ground, is nothing, on comparison with the benefit of having each sort equally distributed.

Successive management.—In this respect, no other attention is necessary than to keep every sort of stock out of the field most assiduously through all the following autumn and winter. Some writers direct manuring; but this should have been done previously to sowing the winter tares, if done at all. After sowing, none is admissible but such dressings as may be sown by hand.

CONVERSION OF POOR LAYS.

There are, on many farms, tracts of barren lays, from moss, poverty, neglect, and bad herbage, upon which a very great improvement may be made by a single ploughing in August. For this purpose, a strong four-horse plough must be used with a skim-coulter; then go over it twice in different directions with the scarifier, so as not to disturb the flag; harrow it once, and immediately sow a quarter of a peck of cole-seed, two bushels of cock's-foot, and one bushel of Yorkshire white per acre, adding some of whatever seeds may be procured at the moment cheaply. Leave it unfed and untouched till the March following, in which month, and through April, load it well with sheep; the use will then be very great; keep sheep feeding it heavily through the year; the cole will be killed, and you will have a pasture worth treble what it was before. The expence is small, and the improvement rapid.

SHUT UP ROUEN.

The time for shutting up after-grass for use the following winter and spring, will depend on the richness of the soil: directly from the scythe is the proper period for lands of moderate fertility, that lett from 12s. to 25s. an acre; but, in fields of greater richness, from 25s. to 35s. August is a better month, feeding till then quite bare; and, on still richer lands, September may do. On the fine salt-marshes of Lincolnshire there is such a spring all winter, that two sheep an acre are fed without any previous exclusion. This husbandry cannot have too much attention, for it is by far the most certain dependence a man can have for his flock at the most pinching period of the whole year. Lands fed in the spring may be kept equally with those mown.

SEPTEMBER.

WHEAT.

UPON all cold, wet, and backward soils, September is the best season for putting in wheat, provided other circumstances permit it; such are principally the weather, for wheat should not be sown till rain comes in *tolerable* plenty; and never in a dry season. Upon drier and warmer soils, it is better to postpone this business till October. But in this case, let our farmer remember, that clover and other layers should be ploughed (if rain comes) in September, for it is a great advantage to have such layers remain unsown for three weeks or a month after ploughing. Another general observation is, that in proportion to the earliness of the sowing, may be a small deduction from the accustomed quantity of seed; two bushels sown any time in this month, are equal to three in November.

SORT OF WHEAT.

These are numerous, and many of them known in different counties under different names, which necessarily causes some confusion in reports that are made on this subject. It is here necessary to notice but a few of the sorts.

1. Red lammas; a red straw, red ear, and red kernel; reckoned by many farmers the best of all the sorts hitherto known, and yielding the finest

and whitest flour. There are also a yellow and a brown lammas.

2. Hoary white: white straw, ear, and grain.

3. Bearded; productive on very poor, cold, wet land; but a coarse grain, and sells for an inferior price.

4. Clark wheat; red blossom, chaff, and straw, but white grain; a favourite sort in Sussex.

5. Hedge wheat; white: very productive.

6. Velvet; a distinct sort from the hoary white; it is a white wheat, and though not weighty, yields much flour; a very thin skin.

7. Cone wheat, of various sorts, so called from the shape of the ear.

STEEPING THE SEED.

The modes of steeping, brining, and liming the seed, are innumerable; all are equally intended as precautions against the smut. I made several experiments on this object, from which it appeared, that steeping from twelve to twenty-four hours in a lye of wood-ashes, in lime-water, and in a solution of arsenic, gave clean crops from extremely smutty seed; but a short time in those mixtures had a much less effect.

November 9, 1786, marked twelve beds of good sandy loam, in great heart, on a clay-marl bottom, and struck drills at one foot. Prepared the seed differently for each.

1. White velvet wheat, a year old, that was very smutty: no steep or lime.

2. Velvet wheat of this year, and very smutty, swam in brine, and limed.

3. Ditto ditto, of this year, steeped 24 hours in a steep of lye, arsenic, &c.*

4. Ditto ditto, 14 hours in the same.

5. Ditto ditto, swam in the same steep, and limed and sown directly.

6. Ditto ditto, washed repeatedly in common water till clean, then swam in the steep, dried with lime, and sown directly.

7. Ditto ditto, merely washed well in common water.

8. Ditto ditto, dry from the barn; nothing done to it.

9. Ditto ditto, steeped in lime-water, made with hot water in the manner prescribed by Mons. Tessier†, and dried with lime; then in the arsenic steep, and again dried with lime.

10. Ditto ditto, washed in the same lime-water, and then dried with lime; as by Mons. Tessier.

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* Made half a hogshead of strong lixivium of wood-ashes, put it in a cast-iron boiler, with 7lb. of common salt, and 1lb. of arsenic; boiled it, and kept it in the boiler for use when cold. This is Mr. Andrews's steep, except the salt, which he does not use.—See vol. vi. p. 174.

† See Annals, vol. vi. p. 208.

11. Velvet wheat, steeped 12 hours in a pickle made of hot lime-water; to which added the vegetable powder of M. Brongniart, dried with lime.

12. Ditto ditto, steeped four hours in the arsenic steep; dried with lime.

Sowed them November 11: the contents of each division, a rod square. All the seed was exceedingly smutty. Very little of the old seed ever vegetated. The 9th of May I went to France, and therefore, besides leaving directions with my bailiff to note the result, I requested my friend and neighbour, Mr. Carter, to view them at the proper season, and minute the appearance. The following is a copy of his note:

July 26, 1787.

1. Ears fine: smut inconsiderable.

2. Very smutty: far inferior to No. 1.

3. Equal to No. 1 in smut, and to No. 2 for growth.

4. No smut: growth as No. 2 and 3.

5. 6. Growth as No. 1, but more smut.

7. Very smutty.

8. Not so bad growth as No. 7.

9. 10. Better: but some smut.

11. Ears as No. 2: nearly free from smut.

12. Ditto: but more smutty.

The following is the copy of my bailiff's account, taken afterwards:

No. 1.	7	smutty ears,
2.	105	do. do.
3.	5	do. do.
4.	6	do. do.
5.	35	do. do.
6.	32	do. do.
7.	$\frac{3}{4}$	of the whole smutty,
8.	$\frac{1}{2}$	smutty,
9.	20	smutty ears,
10.	75	do. do.
11.	5	do. do.
12.	10	do. do.

As a great deal of the old seed never came up, the proportion of seven smutty ears in the remainder is considerable, and should shew that sowing old seed is not a security when the wheat is so very bad.

The first, in point of freedom from the distemper, are those steeped in arsenic 24 hours, and M. Brongniart's powder: these are equal, with this superiority, that 12 hours with the latter are equal to 25 with the former.

The next in freedom, and nearly equal, is that which was 14 hours in the arsenic-steep: and the next to that, No. 12, which was only four hours in the same steep. The superiority of arsenic to all the rest is decided; but it is remarkable, that the time of steeping seems of consequence. Twenty-four hours lessens, by half the quantity of smut, on comparison with four hours. In Mr. Andrews's method, the seed is not steeped at all, but only swam. No. 6 was nearly his method, but it failed here very much; yet the quantity of arsenic I used was double what he prescribes. The reader is, however, to remember, that no man in his senses would sow such seed as that of this experiment. That gentleman's method is certainly sufficient, with fine clean seed, because no crops are cleaner than his; but to discover on what circumstance of the preparation the security depends, is an object certainly of consequence.

Every operation the seed went through did good: washing in common water, lessened the smut from one-half to one-third.

Swimming in brine, and liming, appears to be utterly deficient.

A striking feature in the result is, the utter failure of the method so warmly recommended by Mons. l'Abbé Tessier: yet nothing can be more decisive than the circumstances, as reported by him; and in consequence of his and M. Tillet's experiments, the King's Council in France issued an edict, prohibiting the use of arsenic and other poisonous drugs. Conclusions are not to be drawn from one experiment. I shall repeat this, and with variations.

December 7, 1787, sowed 14 beds with the same wheat-seed, as black with the smut as I ever saw any.

No. 1. Sown dry: nothing done to it.
2. Washed well in clean water.

No. 3. Washed in lime-water.
4. Ditto, in a lye of wood-ashes.
5. Ditto, in an arsenic and salt mixture; as in last year's trial.
6. Steeped in lime-water, four hours.
7. Ditto, in the lye, four hours.
8. Ditto, in the arsenic-steep, four hours.
9. Ditto, in lime-water, 12 hours.
10. Ditto, in the lye, 12 hours.
11. Ditto, in the arsenic-steep, 12 hours.
12. Ditto, in lime-water, 24 hours.
13. Ditto, in the lye, 24 hours.
14. Ditto, in the arsenic, 24 hours.

RESULT.

No. 1. Had	377	smutty ears,
2.	325	
3.	43	
4.	31	
5.	28	
6.	12	
7.	3	
8.	1	
9.	6	
10.	0	
11.	4	
12.	0	
13.	0	
14.	5	

The principal objects to attend to in these results, are the mode of steeping, which entirely prevented the malady, and these evidently depend on the time the wheat remains in the steeps. Nos. 10, 12, and 13, were 12 hours in it at the shortest; and lime-water not effective in 12 hours, but secure in 24, confirms this doctrine. Old wheat is clearly much less exposed to the malady than new; and I have since heard of many farmers trusting with entire confidence to old wheat, and not wetting it at all: but, of course, they would not sow a sample which they knew had been smutty.

WHEAT AFTER FALLOW.

If there is one practice in husbandry proved by modern improvements to be worse than another, it is that of sowing wheat on fallows: all I shall therefore observe under this head is, to note that in some counties, the fallows are ploughed just before harvest on to two-bout ridges, ready to plough and sow under furrow in the spraining method; a seedsman to every plough, which reverses the ridges. In others they lay their lands into ten or twelve furrow stitches or lands, and sow some under furrow, some under the harrow. Ridges vary exceedingly, according to their wetness; and in Kent they have, by means of the turn-wrest plough, no lands at all, but a whole field one even surface. It would be useless to expatiate on the circumstances of fallow-wheat, which ought no where to be found. If fallows be, or are thought necessary, let them be sown with barley or oats, or with any thing but wheat.

WHEAT AFTER BEANS.

Beans, if well cultivated, form the best preparation for wheat; I have seen in Kent a field of wheat which followed four preparations, beans, clover, tares, and fallow, and the first was superior to all the rest; next the clover, then the tares, and the worst was after the fallow. If our young farmer has a bean-stubble on which he intends sowing wheat, he should be as early as possible in giving it the due tillage; this will depend on soil, for on some it will be more advantageous to trust to the shim, scarifiers, and scufflers, than to the plough. If the land is very clean, the great Isle of Thanet shim will cut through every thing, and loosen the surface sufficiently to enable the harrows to leave it as clean and fine as a garden, women attending to pick and burn. If less clean, the Kentish broad-share may do the work more effectively. In other cases the scuffler may be equal to the business. When he has got the surface to his mind, he is to consider whether or not he should plough it, which is advisable if the soil be of a firm, solid, tenacious quality, and if he does not intend to drill the wheat: if he ploughs such a soil, he may not have any apprehension of root-fallen wheat, failing roots from a loose bottom; but he will bring up a new surface that may drill with difficulty: whereas that which has received the influences of the crop, atmosphere, and of his late operations, will be in exactly the right temper for the drill to work in.

If the soil is of a more loose, friable quality, and he should plough down the fine surface he has gained, he will give the wheat too loose a bottom, and he will run the chance of a root-fallen crop. In such cases, or in any that have a tendency to this circumstance, he should determine not to plough at all, but drill directly; a method in which he saves tillage, and has the probability of a better produce. This is a new practice on strong land, but I have seen such success in it as leaves no reason for doubting the soundness of its principles. Mr. Ducket, on a sandy soil, did it for years, and with great effect. It should be remembered, that whatever other circumstances may influence the growth of this grain, it loves a firm bottom to root in, and rarely flourishes to profit when it is loose and crumbly, nor will a depth of such mould do if the under stratum in which it will attempt to fix its roots, be from its quality repellent. The best basis is the cultivable earth, firm from not having been lately disturbed. No such rules can be general, but the case happens oftener than some are willing to suppose.

WHEAT AFTER CLOVER.

Clover forms a very excellent preparation for wheat, yielding ample crops of the golden grain at a very light expence: so that, while the Norfolk husbandry, of, 1. Turnips; 2. Barley; 3. Clover; 4. Wheat; is practicable on a farm dry enough for turnips, and rich enough for wheat, a man may well enough be satisfied with his profit; but after many repetitions (and this system has been common for above fifty years), it was found that two evils gradually appeared, which were unknown at the first introduction of it. Turnips demanded ample manuring where they were once produced of larger size without any; and the clover became so subject to failures, that it was no longer easy to have it every fourth year. This created the necessity of variations (of which more in another place), but still retaining clover as the preparation for wheat. The husbandry, however, was very imperfect, from the mode of putting in the wheat, which was merely by the harrow, in which method (for the skim-coulter was unknown) the seed was too apt to fall into the seams of the furrows, and came up consequently among whatever grass and weeds might be in the land. The discovery of dibbling was a very capital improvement; in this method the seed was deposited in the centre of the flags, and the regular treading the land received, pressed down the furrow, and gave a degree of firmness not otherwise attainable. The success was great; and had the labouring poor kept to that care and accuracy which they began with in dibbling, the practice would never have lessened; but the great earnings they made gave a spur to their avidity, and they have both in Norfolk and Suffolk done it of late years in so slovenly and careless a, manner, that drilling is every where coming in, instead of a practice esteemed by many of the most intelligent farmers as unrivalled, when well performed. At present, it is thought in those counties the mark of a bad farmer, to sow broad-cast wheat on clover.

The land having been ploughed a fortnight or three weeks*, it is to be well rolled down with a heavy roller, and then dibbled: here, as in all other cases, the chief attention is to be paid to the dibblers making the holes deep enough, and to the children dropping equally without scattering. It is then bush-harrowed. Six pecks of seed is enough for two rows on a flag in this month. But if only one row, still I would recommend as much seed to be put in. And another observation it is necessary to make, that if the land is known to be given to the mildew, an increase of seed on that account is right, whatever the soil or season; by reason of the well-known fact, that all thin crops suffer more from that distemper than such as are thicker.

In regard to drilling, the various directions given in the spring Calendars, relative to accurately ploughing the lands either for one stroke of the drill-machine, or for a bout of it, are equally applicable to drilling wheat. The operations are the same, and therefore to dwell on them needless; but it should be remembered, that in ploughing all lays, the use of the skim-coulter is very great, and in some cases indispensable: an effective harrowing should precede the drill. The quantity of seed the same as in dibbling.

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* On to drill-stitches, if that husbandry is at any time to be practised in the field.

A very singular experiment of Mr. Ducket's on preparing a clover lay for wheat, should here be mentioned: he had a field in which wheat rarely escaped being greatly root-fallen: not to lose sowing it with that grain, and at the same time to guard against the experienced malady, he scarified it repeatedly, till he had torn up the clover, and also gained tilth enough for drilling in; then he collected the clover fragments, and carted them into the farm-yard to make dung, and drilled the field: the wheat having a firm bottom in an unstirred soil, escaped the disease, and yielded an ample produce: very singular husbandry, and admirably adapted to the peculiarity of the soil. The clover-bulb, which would have secured the dreaded looseness had it been turned down, made a large quantity of dung, and therefore, was not lost to the farm, though the particular field was deprived of it. No saving of expence was here made, but an extraordinary one incurred; but it secured a crop where otherwise there would have been none.

WHEAT AFTER TARES.

A good crop of winter tares leaves the ground in such loose, putrid, friable order, that it is much better husbandry to sow turnips or plant cabbages on it, than leave it to receive tillage for wheat.

However, if this management should take place, the land should not be ploughed at all, but left to consolidate at bottom, to become firm for the roots of the wheat to fix in, and the surface worked with the scarifiers or scufflers, according to its temper, just sufficient to keep it clear of all weeds, and in that state, drill the wheat without any ploughing. This I have practised with good success.

WATER-FURROWING.

A circumstance of much importance in the culture of wheat, but oftentimes strangely neglected, is water-furrowing: this work should be well and effectually performed on all lands, except those that are perfectly dry all winter through. The water-furrows should be ploughed as soon as the field is finished sowing, ploughing, &c. and then a spit should be dug out from the bottom of them, and laid on one side opposite the rise of the land, and the loose mould shovelled out: the openings of all the furrows should likewise be cleansed, so that the water may have an easy fall out of every furrow into the water ones. The number of these must ever depend on the variations of the surface; the only general rule being to make them so numerous, that no water can stand on the land in the wettest weather. In bottoms of fields, or other places, where there is a double slope of the land, it is necessary to cut double water-furrows, about a yard or four feet from each other, to take water from each descent.

BUY IN SHEEP.

If there is not a regular flock kept upon the farm, the annual purchase may be supposed to take place at fairs towards the end of August, or all through September; and the sort most commonly bought is wether lambs, and I believe more profitably than any other. They used to be had for 15s. in the breeds of Norfolk, the South Down, and others of a similar size; but of late years they have risen to 20s. and even higher. There are two systems of keeping them; one is, to put them to the very highest keep, and push them by every means to sell as soon as possible; the other, and I believe the more advantageous method, is to keep pretty well till March, and then to full keep, and begin to sell in harvest, continuing till September or Michaelmas, and then clearing all. In this way I have often known the purchase-money doubled, besides the fleece. Sometimes much more is done, but this may be looked for on an average of years.

BREED OF SHEEP.

In buying in the wether lambs mentioned in the preceding article, there will not probably be much choice in the vicinity; and it is not commonly a profitable speculation to send into distant counties for breeds very different from those of the neighbourhood. At present, such has been the spirit of making these importations for the purpose of breeding, that there are not many districts where a farmer has not a choice. The new Leicester first, and then the South Downs, have made remarkable inroads in various parts of the kingdom. The former come in competition with all the long-woolled breeds; and the latter with all the short and middling-woolled ones. When bred in sufficient plenty to be had as wethers, the new Leicester are *generally* to be preferred. The only doubtful exception I have heard is, *when wool sells high, upon very rich marsh land in Lincolnshire.* I know of no competition between the South Downs and other fine-woolled breeds, in which the South Downs should not be preferred. In buying wether lambs for mountainous moors in the North of England, the black-faced long coarse-woolled Scotch are the common sort, and I believe much superior to any other, for regions of real and severe hardship.

In all this matter, the young farmer is to bear in mind, that for an annual stock, he is to discard all prejudices that are attended with expence; these must be transferred to the breeding systems, and *there* well considered before they are adopted.

CRONES.

It is a common system in many enclosed districts, to buy old crones in September, to put the ram to them in October, and to sell the lambs as they become fat for the butcher, and then to fatten the mothers, clearing within or about a year from the time of buying. This system is well enough where fences are very secure, and food very plentiful; but in general it is inferior to wether lambs.

In buying any sort of sheep that are to be *wintered* on turnips, the young farmer should not calculate on more than ten to an acre of *very good* turnips: and, in providing stock for fattening, the best acres must not be expected to fatten more than seven or eight; and middling crops not more than five or six; due provision being made beside for taking the stock when turnips are done.

FATTING BEASTS.

You must now be very attentive to the state of your fatting beasts, and the remainder of their food; see, therefore, that the cattle do not stop for want. A beast that is nearly fat must have plenty; he is nice, and if he is at all curtailed in his *pasture*, will fall off. It is excellent management to have August-sown cabbages now ready for the fat beasts, and to carry them on to Christmas: grass declines after this month; and if rouen is freely turned into in September, twenty to one but the ewes and lambs will be distressed in March and April: whatever grass is now used on the farm, will pay far better by sheep than by feeding at present. The soil, however, must in some measure govern this distribution; for all lands that are subject to floods, or that have a tender and poaching surface, should be left quite bare before the heavy autumnal rains come. The farmer's judgment must be exercised in this, as in so many other cases; dry sound soils answer best for kept rouen.

Remember that beef is cheaper at Michaelmas than at any time throughout the year; for grass-fed cattle are then at once brought to market: this should give the attentive grazier an idea of varying from the common method; to sell only a part of cattle at this time.

In drawing off a lot or lots for sale, it is common to sell the fattest, and keep on the ill-doing ones for further exertions. If the food provided be not costly, this to a certain degree is *admissible*; but if the beasts are for cake or corn; or the quantity of other food rather limited, it is a very questionable conduct. I would not give expensive food to stock which have proved themselves unthrifty, but, on the contrary, draw off for this purpose the most thriving ones in the lot: the contrary conduct has often been the reason why all winter-fatting has been so heavily condemned. The moment a grazier is well convinced that he has a beast that is an *ill-doer*, the first loss is the best, and he should get rid of him as soon as he can.

COWS.

The dairy of cows must have plenty of grass throughout this month, or their milk will be very apt to fail. • Lucern, mown green, and given them in a yard, is the most profitable way of feeding: the product is so regular, that it is an easy matter to proportion the dairy to the plantation, and never be under a want of food; for lucern, mown every day regularly, will carry them into October; and although some persons have asserted that cows will not give so much milk thus managed, as when they range at large, and feed how and where they will, it is not a matter of inquiry; because, if they give less, the quantity will pay more clear profit, than more in the other case: there may be some inferiority; but the cows are kept on so small a quantity of land, that there remains no comparison between the methods, for profit.

But however doubtful this matter might once have been, it is so no longer; and the *experimentum crusis* of the cows kept at the gaol of Lewes by Mr. Wm. Cramp, has decided the matter beyond all question: a produce of from 50l. to 70l. per cow, should for ever put to silence the silly objections which have been made to this practice, and ought most effectually to convince us, that the common system universal in the kingdom, is, on comparison with that of confinement, a most barbarous practice.

THE TEAMS.

These must be kept at work. Wheat-sowing is a business in which we usually stretch a point, and make the ploughs do full work. Both horses and oxen should be kept this month to lucern, &c. mown every day: they will work as well on it as any other food; but, while they plough, they must have oats and chaff with it; for no grass at this season of the year is so nourishing as it was in the summer.

MANURE GRASS.

Dung should not be kept until it is so rotten that it will wash into turf; because, by that time, it loses its virtue at a great rate, and, while in full fermentation, it is of great utility to all land. There are many succedaneums for dung, or at least for making it go much farther on grass than on arable: the proper composts are chalk, clay, turf, ditch-earth, pond-mud, lime, ashes, soot, with some dung; all, or some of these, mixed together, will be in order for spreading on grass lands, and will be highly sufficient to keep them in good heart, with but a small quantity of dung. The end of this month is a proper season for carrying such composts on: lay about 15 or 20 yards an acre. It is difficult to over-manure arable lands, but very easily done on grass; because large quantities do not wash in quick enough. Let the compost heaps be spread very regularly. A good farmer will manage to give his pastures, unless they are very rich, a dressing of compost every four years. Always add a pound of common salt to every cubic yard of compost sprinkled in, in turning over.

SCARIFY GRASS LANDS.

Scarifying grass is a new practice of some ingenious gentlemen, but not yet become common husbandry. It consists in cutting the turf with a plough of coulters, or with a ploughing harrow; so that the surface may all be cut or torn: this operation is on principles directly contrary to the common idea of rolling in autumn, which is done with design not only of levelling for the scythe, but also of pressing the surface as much as possible, for which the heaviest rollers are chosen, until some are worked that require six horses.

BURNET.

Observe, not to let any cattle pasture your burnet fields after mowing; for the greatest peculiarity of this plant is to afford a full bite in March; and if you leave it six or eight inches high in October, you will find more the beginning of March, and in possession of the leaves it had in autumn; for the winter's frosts have not much effect on it. Upon this caution, therefore, depends much of the advantage of burnet: some who have found fault with it, and asserted that it is unprofitable, have fed off the after-grass in autumn bare, and let their sheep and cattle get into it in winter. It is then no wonder the burnet does not answer the character given of it by others, who have managed in a different manner.

SAINFOIN ROUENS.

Sainfoin does not, like clover and lucern, produce two several cuts in one season, but the rouens yield great store, of a salubrious and highly nutritious diet, for cattle of every kind. As the sainfoin rouens are supposed to have a disagreeable taste till sweetened by the autumnal frosts, the better way is to avoid stocking them till towards Michaelmas, when these rouens will be found abundantly to increase the milk in cows, and are no less beneficial for improving fatting beasts in flesh; and when these are taken out, there will still remain good store of sheep-feed. But in feeding sheep on sainfoin rouens, one caution is proper to be attended to; and this is, not to lay them too thick on the pasture, or to suffer them to remain in the field beyond a stated period. In either case, they would do much injury to the future crop, by knawing off the crown of the plant. In my opinion, cattle of every kind ought to be taken out of the sainfoin rouens by Christmas; for as this grass begins to shoot very early in the spring, the next year's shoot would be considerably retarded, by permitting the stock to remain on the rouens long after the period above-mentioned.—*Bannister.*

FERN.

Cut fern, called in some places brakes and brakens. This is most profitable work, and should never be neglected. Carry it into the farm-yard, and build large stacks of it for cutting down through the winter, as fast as the cattle will tread it into dung; also for littering the stables, ox-houses, cow-houses, hog-sties, fatting-sheds, &c. By having great plenty of it, you will be able to raise immense quantities of dung, which is the foundation of all good husbandry; and it is well known, that no vegetable yields such a quantity of salts as fern: from which we are to conclude, that it is well adapted to the making manure. The good farmer, in this work of bringing fern, should not confine himself to his own wastes, of which he may have none, but purchase it of his neighbours, if they are within a tolerable distance. It will answer exceedingly well: he need not therefore fear paying for it, as for refuse straw.

STUBBLE.

This month is the proper time for cutting the wheat and rye stubbles, and raking into heaps, for carting home to the farm-yard for litter, upon the same principle as fern is carted there. This is a business strangely neglected in most parts of the kingdom; but is nevertheless of great importance: the stubble left on the land is not of much advantage as a manure; it prevents the plough from turning in the land with neatness, and a crop does not succeed soon enough to feed on it; but, carted into the farm-yard, it becomes an excellent manure. Any sort of litter there is valuable, and serves for the cattle treading into dung. In those parts of the kingdom where this use of stubble is common, the price for cutting and raking into heaps is from 2s. 6d. to 3s. 6d. per acre; a very small expence, compared with the great advantages that undoubtedly result from it.

HOPS.

This is the season for hop-picking. To name it is sufficient in such a work as this, for no prudent man would venture upon so operose a business as this article of culture, by means alone of such information as he could find in books. Mr. Marshall has treated the subject in detail; and many other writers have given information concerning it, from Reginald Scott to the present time.

PLOUGH FALLOWS.

Now, if you have leisure, let your ploughs turn up all sorts of stubbles: this is one of the material parts of husbandry, in which some farmers are greatly wanting: they form very mistaken ideas respecting this part of husbandry, suffering their lands designed for fallows, &c. to remain till after barley-sowing, before they break them up.

WATER-FURROWING.

Make it a rule to water-furrow all wet fields, as fast as the plough leaves them: this is an important work on autumnal ploughings; for the dryness and health of the land depend on the cutting them with judgment.

LUCERN.

The lucern will yield another cutting probably this month; but at farthest, the first week in October; after which the succeeding short growth is no object; but, if it is cut the beginning of this month, there may be another the end of October. But, when the last is taken, manure the plantation with long dung.

Lucern requires much manure: it will, on good land, yield very beneficial crops without any; but, to be carried to the highest perfection, not only of *product*, but also of *clear profit*, it must have plenty.

SOILING.

This is a period in which some farmers, who understand soiling well through the height of summer, are apt to grow negligent in it; but if due preparation was made, by a right succession of cuttings of lucern, chicory, tares, &c. with a reserve, if wanted, of common grass of the right age, it should be steadily adhered to throughout the month. There is plenty of food, it is true, in the fields, but this should be eaten by sheep, which should be cheaply maintained through the months of September and October.

SOW WINTER TARES.

This is the principal month in the year for sowing winter tares. The earlier they are got into the ground the better; for the difference of forwardness in the spring, from only a week difference in the time of sowing, is sometimes great. Three bushels an acre are the common quantity of seed, broad-cast; but some sow only two and a half thus early. If they are drilled at six inches, two are enough. Our young farmer will proportion the breadth of ground he applies to this crop, to the circumstance of the quantity of lucern or chicory he has for the purpose of soiling: if he has little or none of those plants, he must appropriate a good breadth to tares, for in such case he will find them very advantageous.

SEED TARES.

"When tares are sown with a view either to cut green for the horses, to feed down with sheep, or to mow for fodder, the allowance is three bushels to the acre; though there are many people who content themselves with sowing two bushels, or two bushels and a half; and when it is designed that the tares shall remain for ripening, two bushels, or two bushels and a half, is a quantity sufficient to crop an acre; but in either of the instances first mentioned, three bushels will not be found too liberal an allowance; for it may be laid down as a general rule, that where the haulm or stalk is the chief object in view, the seeds ought to be thickly sown, that the plants may be encouraged to shoot away the more freely in their growth. Thus, in the several tribes of grasses, where the chief end is to obtain a crop of fodder, a much larger proportion of seed should be allowed than if it were intended to remain on the ground till harvest; for, by being sown thick, the progress in growth is much accelerated: and this observation deserves to be more particularly attended to in the cultivation of the tare; for this pulse, like pease, never grows away with freedom, till the tendrils begin to meet, and they come (as the farmers express it) to shake hands with one another; and for this reason it is better to sow tares, whether of the winter or spring kind, by broad-cast, than in rows, as is practised in East Kent."—*Bannister*.

SOW WINTER TARES ON POOR PASTURES AND MEADOWS.

This very extraordinary husbandry was the invention, if I may be allowed the expression, of a very ingenious and excellent farmer, Mr. Salter, of Norfolk: wherever he improves poor meadows or pastures by spreading earth, clay, chalk, marl, gravel, &c. he harrows in winter tares on such manuring, and, if wanted, grass-seeds or white clover. And it is a curious fact, which I have witnessed on his farm at Winborough, that the grass-seeds succeed better where winter tares are sown, than in any spots where by accident there happens to be none. The improvement of the old grass by the tares is very great, and the value of the tare crop is considerable in soiling, or in hay. This husbandry is new, extremely interesting, and much deserves imitation in many cases.

LAYING TO GRASS WITH WHEAT.

Next to laying down upon a clean fallow and sowing the grass-seeds in August, I believe as good a system as can be pursued is, to sow the seeds with wheat very early in September, provided the weather be favourable for putting in the wheat. I have had very good success in this method. The land must be either a fallow, or sown early with winter tares, and these mown for soiling, after which there is plenty of time through the heat of the summer for fallowing the land. The seeds are detailed in the Calendars for April and August.

FAILURE OF NEW LAYS.

If the recommendations given in this work be closely attended to, there is little reason to apprehend this; however, as it is possible, from extremely unfavourable seasons, something should be said on it. Such a failure can scarcely happen to more than one or two of the seeds; in this, or indeed in any case of failure, fresh seed should be sown in a moist time in the spring, and if a flock of sheep can be driven over the land, it will be a good way to cover them; if not, it should take its chance, for a roller will not so well effect it, and a harrow cannot enter without mischief. If a very large fold (five or six yards to a sheep) be run over the field once in a place, and the seeds sown before the sheep enter, success is almost certain. At least I have found the benefit of thus thickening new lays in seasons not peculiarly favourable.

Should, however, a total failure, from any unforeseen cause, take place, the better conduct will be, in fields that were sown in the spring, to clear the corn as early as possible, and, ploughing once, harrow in fresh seeds immediately: this will succeed very well if they are got in in the month of August, or early in September; the sooner the better: and in this case the land should be very well rolled in October, in a dry season. If the failure happens in land sown in August, it should have three earths in dry weather in the spring, and the grass-seeds re-sown with buck-wheat in May: that is not a crop for clays and wet loams, but I have known it succeed well in a dry summer; should the season be wet, it will give little seed, and should be mown when in blossom for soiling cows. It is an ameliorating plant, never exhausting any soil, and therefore preserves in the land the fertility gained by the operations previous to the former sowing. And I may here generally observe, that grass seeds of all sorts, and on all soils, never succeed better than with buck-wheat, of which not more than one bushel an acre should be sown. There is a district in Norfolk where buck is highly valued for this object. It is a profitable article of cultivation on the very poorest barren sands.

AUTUMNAL MANAGEMENT OF NEW LAYS.

This is a point of considerable consequence, and in proportion to the moisture of the soil. All trampling of cattle and horses is pernicious, for the soil, after a crop of corn, or after the tillage of a fallow, is very tender, and affected by every impression: it is also bad to feed the plants, as I have found by much experience. The safe way is to keep every thing out through both autumn and winter. The profit of feeding is absolutely nothing, for the pasturage in the spring for sheep is of far more value, by reason of not eating it in autumn: at the former season it affords a most valuable and very early bite for ewes and lambs.

OCTOBER.

SEASON.

IT is necessary to remind the reader, that a circumstance takes place in respect to this month, which scarcely holds with any other in an equal degree: by *October*, is to be understood that period of good or tolerable weather which usually takes place before the change by rain, snow, or frost stops most field operations; what is now directed to be done must often be executed in November: if the farmer cannot effect it in the first of these months he must do it in the second.

HIRING FARMS.

This is commonly the month for hiring and stocking farms, and moving from one to another. Upon such occasions, the farmer should have his attention awakened: he should be equally clear-sighted to the advantages of a farm and to the disadvantages, that he may be able to draw a balance between them, and compare that balance with the rent demanded. Let him consider, that he must equally discard a too solicitous prudence, which doubts every benefit, and a too daring courage, which overlooks or lessens real evils. It must be open to almost every person's observation, that many lose themselves in deliberating concerning a farm: they have so many mistaken rules of judging,

ing, that we sometimes see them reject farms which soon after are hired by others, and prove the fortunes of such: they are apt to take one false guide in particular—the success of the last tenant. If a man makes a good deal of money on a farm, or leaves it for a much larger, numbers will immediately apply with eagerness to get it; but if a tenant or two break, or are poor on a farm, most of the neighbours consider little farther: they attribute too much of the ill success to the land, and avoid it, under an idea that, without a fall of rent, no money can be made on it.

Soil.—Let the farmer that is debating whether he should hire a farm that is offered him, examine the soil well, to be able to determine its nature, the stiffness, moisture, exposure, levelness, slope, stoniness; what draining, manuring, fencing, &c. will be wanted: let him see to the roads, distance of market, prices of commodities, labour, &c.; let him fully acquaint himself with the state of tithes or gathering. He should know the poor-rates, attend to the compactness of the fields, and consider well the covenants relative to cropping; for many such are extremely detrimental to a good conduct of the land.

One general rule in hiring a farm should not be forgotten—to fix on good land, and he can scarcely pay too much for it; but, for poor soils, the least rent is sometimes too high to be consistent with profit. By *poor soils*, however, are not to be understood such as have a command of lasting manures, that work great improvements; nor waste lands, which, under that false denomination, are often found the most profitable of all.

The sound, mellow, rich, putrid, crumbling, sandy loams, are of all soils the most profitable; such as will admit tillage soon after rain, and do not bake on hot gleams of sun coming after heavy rains, when finely harrowed: such land is better worth forty shillings an acre than many soils deserve five.

The next soil I shall mention is that of the stiff loam, which is nearest allied to brick earth; this, till drained, is in general an unkindly soil, without plenty of manure. It is known in winter by being very adhesive upon walking over it; is long in drying, even when little or no water is seen upon it; for which reason it is generally late in the spring before it can be ploughed. When quite dry, it breaks up neither so hard and cloddy as mere clay, nor near so crumbly and mellow as the good loam. If it is in stubble, it is apt to be covered with a minute green moss. There are many varieties of this soil, but all agree in most of these circumstances, and in being what the farmers call poor, cold, hungry land. When hollow-ditched, and greatly manured, it yields any thing; but those who hire it should forget neither of these expences.

The gravelly soils are numerous in their kind, and very different in their natures. Warm, dry, sound gravelly loams, are easily distinguished in winter. They admit ploughing all winter through, except in very wet times; always break up in a crumbly state of running moulds; and if a stubble, will dig, on trial by the spade, in the same manner. If under turnips, you may perceive, by walking through them, that it will bear their being fed off.

The wet, cold, springy gravel, is a very bad soil; it is known in winter by the wetness of it; and in spring, by its binding with hasty showers. It rarely breaks up in a crumbly state, or shews a mellowness under the spade. Very expensive drains greatly correct its ill qualities, but it requires a prodigious quantity of manure to fertilize it.

Some gravels are so sharp and burning, that they produce nothing except in wet summers; but such are known at any season of the year. Sands are as various as gravels, and are all easily discoverable in their natures. The rich, red sand is, I believe, as profitable a soil as any in the world. It has at all seasons a dry soundness, and at the same time a moisture without wetness, which secures crops even in dry summers. The spade is sufficient to try it at any season of the year.

The light sandy loam is, likewise, an admirable soil: it will bear ploughing, like the preceding, all winter long, and appears quite sound and mellow when tried with the spade. If it lies under a winter fallow, the best way to judge of its richness, is to remark the state of the furrows, and the degree of adhesion in the soil. Stiff land being dry and crumbly, is a great perfection, and sand being adhesive, is an equally good sign. When, therefore, the farmer views a light sandy loam, whose sound dryness is acknowledged, he may presume the soil *is rich*, in proportion to its adhesion. If it falls flat in powder, and has no adhesion, it is a *mere sand*. The white chalky *marm* is often cold and wet, will nŏt bear ploughing in winter, unless the weather is very dry or frosty; runs excessively to mortar with a heavy shower when in a pulverized state. It is a cold soil, of little profit, except with peculiar management; but answers best when dry laid down to sainfoin.

In general, let him lay it down as a maxim, that strong, harsh, tenacious clay, though it will yield great crops of wheat, is yet managed at so heavy an expence, that it is usually lett for more than it is worth. Much money is not often made on such land. The very contrary soil, a light, poor, dry sand, is very often, indeed, in the occupation of men who have made fortunes. Some permanent manure is usually below the surface, which answers well to carry on; and sheep, the common stock of such soils, is the most profitable sort he can depend on.

All stiff soils are viewed to most advantage in winter: the general fault of them is wetness, which is in the greatest excess at that season of the year. If the fields are level, and the water stands in the land, notwithstanding the furrows are well ploughed and open, it is a sign that the clay is very stiff, and of so adhesive a nature, as to contain the water like a dish. It is likewise probable, that draining may prove insufficient to cure the natural evil of such land. This kind of soil, likewise, shews itself in the breaking up of stubbles for a fallow; a very strong draught of cattle is then necessary to work it. It breaks up in vast pieces almost as hard as iron. When it is worked fine, it will run like mortar, with a heavy spring or summer shower. These soils will yield very great crops of beans and wheat, &c. They must, like others, be cultivated by somebody; but I would not advise any friend of mine to have any thing to do with them; never to be captivated with seeing large crops upon the land; for he does not see at the same time the expences by which they are raised.

Peat, bog, moor, and fen, in many variations are very profitable; but the expences of improvement demand a calculating head. The vicinity of lime or marl is then of great importance.

In respect to grass lands, the marks for judgment are different. These are best examined by attending, first, to the circumstances in which they are most deficient; and then to such as are in their favour. The more seasons grass fields are viewed in the better; though any one is sufficient for a tolerable judgment.

One evil attending these lands is, that of being too wet; the signs of which can never be mistaken or overlooked in any season of the year. In winter, it is at once perceived by walking on it; at all times of the year by the herbage which generally abounds on it, such as rushes, flags, and a great quantity of moss; and also by the colour of the grass, which is mostly blue at the points; sometimes of a dirty yellow hue, and always coarse. If the soil is the first described stiff clay, and the surface level, the evil will be very difficult of cure; if of the other sort of clay, or stiff loams, draining will have great effects.

Grass fields on gravelly soils are, if the gravel is sharp, very apt to *burn* in dry summers; but they give great and sweet crops in wet ones, provided the land is a gravelly loam. A farmer should not regret having a pasture or two of absolute gravel in his farm, being of excellent use in winter for feeding sheep and lambs with turnips, &c.

The low meadows, whatever the soil, on the banks of the rivers and brooks, are in general good, but often subject to the misfortune of being overflown in summer, which not only ruins crops of hay before they are cut, but carries them away, perhaps, when just made.

Many grass fields on all soils, consist of so bad an herbage as to be of little value. Made up of weeds, and the worst and coarsest of grasses, if a landlord will not allow such to be ploughed, the farmer should minute the rent accordingly. This fault is visible at all seasons.

A river that does not overflow, running through a farm, is a very favourable circumstance, as it indicates a probability of all the grass fields being well watered: that is, for cattle.

Size—Another matter of great import, in the hiring a farm, is the taking no larger a one, than the sum of money a man can command will stock properly. A common fault among farmers is, the hiring too much land for their money; they are extremely eager to farm as much as possible: the certain consequences of which is the conducting the soil in an imperfect manner. In the neighbourhood of great cities and towns, variety of manures are to be had, in some places cheap; but, if the farmers have not money, how are they to make use of such advantages? For these, and other reasons, a farmer should not think of venturing on a tract of land which he cannot command; that is, farm as seems best to him.

Contiguity of the Fields.—Many farmers too often overlook this circumstance: if they attended to it as much as their profit required, we should see landlords reforming their estates in this particular, more than many do at present. There is not a more expensive, perplexing circumstance in a farm, than the fields being in a straggling, disjointed situation. The disadvantages are numerous and striking.

Covenants.—Many landlords are very tenacious of the covenants which they have usually inserted in their leases; so that a man, when he approves a farm and agrees to the rent, may find the conditions of tenure proposed to him, such as are incompatible with his interest, his designs, and even with good husbandry.

The merit or reasonableness of covenants must be considered always, on comparison with the nature of the farm. It is for want of this consideration that unreasonable covenants are ever proposed.

These prohibitions are often foolish, but sometimes admissible: they must depend on local circumstances, to be well weighed by the farmer who hires.

Ascertainment of Rent.—This is a very important part of the business in hiring a farm; but the other circumstances already detailed precede it, rent in a good measure depending on them. The principal point here necessary to touch on, is the combination of rent, tithe, and rates, in one sum. Knowing the capital intended to be invested, estimate the interest of it at not less than 10 per cent. and then calculate the expences and produce: the former deducted from the latter, leaves that sum which the farmer can afford to pay in these three species of rent. Deduct further the tithe and rates, and the remainder is what he can afford to pay to the landlord. If rent be valued in any other way, it must be erroneously and deceitfully done, and no dependence can be placed on it.

The following cases, with which the writer of these papers is accurately acquainted, confirm the idea of one-third of the gross produce being a fair allowance for rent, tithe, and poor's-rates.

Wet loam, on a clay-marl bottom.

Produce.—1. Fallow,	£.	s.	d.
2. Barley, four quarters, at 24s.	4	16	0
3. Clover, ...	2	0	0
4. Wheat, 2½ quarters, 48s.	6	0	0
Two crops straw, ...	1	0	0
	4)13	16	0
	3)3	9	0
For rent, tithe, and rates, ...	1	3	0

The rent in this case (before the scarcity) was 15s.; tithe, 3s. 6d.; and the rates 4s.

The same Soil.

Produce.—1. Fallow,	£.	s.	d.
2. Wheat, 2½ quarters, 48s.	6	0	0
3. Oats, 3 quarters, 20s.	3	0	0
Two crops straw, ...	1	0	0
	3)10	0	0
	3	6	8
For, rent, tithe, and rates, ...	3)1	2	2

The rent in this case, 13s. 6d.; tithe, 4s.; rates, 4s. 2d. The lease expired; a new tenant took it, who hollow-drained the land, and farmed in other respects better.

	£.	s.	d.
Produce.—1. Turnips on about half, the other half fallow,	1	0	0
2. Barley, 4 quarters, 24s.	4	16	0
3. Clover,	2	5	0
4. Pease and beans, 3 quarters, at 24s.	3	12	0
5. Wheat, 2¾ quarters, 48s.	6	12	0
Three crops straw,	1	10	0
	5)19	15	0
	3)3	19	0
For rent, tithe, and rates,	1	6	4

The rent was 16s.; tithe, 4s. 6d.; rates, 4s. 2d.

Sandy loam, on a gravel bottom.

	£.	s.	d.
Produce.—1. Turnips,	2	0	0
2. Barley, 4½ quarters, 24s.	5	8	0
3. Clover,	2	15	0
4. Wheat, 3 quarters, 48s.	7	4	0
Two crops straw,	1	0	0
	4)18	7	0
	3)4	11	9
For rent, tithe, and rates,	1	10	7

The rent in this case was 21s.; the tithe, 5s.; and rates, 4s.

STOCKING FARMS.

The benefit to be derived from the occupation of land, depends so much on the farmer commanding the requisite capital, that it is extremely necessary for the young beginner to be well advised on this essential point. If he is fixed in business by some experienced relation, he will not want the proper instruction; but as many adventurers (as they may be called) are every day making efforts to try their fortunes in the culture of the earth, and many gentlemen taking farms into their hands, sometimes without due consideration of the necessary expences, it is proper to minute a few observations on the subject.

Thirty years ago, the sum that was usually appropriated to stocking a farm, varied from 3l. to 5l. an acre; and it was a general idea, that the latter sum was sufficient for any farm, part arable and part grass, of no uncommon fertility. Rich marshes were, of course, excluded in the calculation; and light flock-farms were often stocked for 3l. per acre. But these matters are now greatly changed; rents are much increased; tithes are compounded at a higher payment; poor-rates are enormously risen; all sorts of implements comprehended in the article *wear and tear*, are thirty or forty per cent. dearer; labour is in many districts doubled: the prices of cattle and sheep are greatly advanced; so that, at present, the same farm which at that period would have been very well stocked, and the first year's expences provided for, at the rate of 5l. per acre, now demands 7l. to 8l. per acre. But it is to be remembered, that in all such estimates it is necessary to suppose that every implement bought in is new, and that the live stock be good of the sort, and that the first year's expences be provided for, though a portion of the crop *may* come in before the whole payment is made. A man cannot be at his ease if he does not thus provide; nor will he be able to make that profit by his business with a small capital, which will attend the employment of a larger. By *profit*, I would be understood to mean a per centage on his capital, which is the only satisfactory way of estimating it. If, by stocking a farm with 5l. per acre, he makes 7 or 8 per cent. profit; and, by stocking in the proportion of 8l. per acre, he makes 10 per cent. (and this difference will, I believe, often be found), it must be sufficiently apparent, that the loss by the smaller stock is a serious evil. It will depend much on situation and local circumstances: the benefit of procuring manures, or litter to make dung, may, in some places, be very great, in others much less; but not to be able to profit by every favourable opportunity that may attend the spot on which a farmer is fixed, must be highly disadvantageous. To irrigate land is an expensive operation; but to omit or postpone it, for want of money for the undertaking, is to lose perhaps, the capital advantage of a farm. Cases of this sort might be greatly multiplied; and there is not one that does not call on the farmer for an ample capital.

Of all farms, a warren is hired with the smallest capital; but there are marshes in Lincolnshire stocked at the rate of above 30l. per acre.

The annual expence of many hop-grounds amounts to 30l. and the capital to above 60l.

If a farmer does not make 10 per cent. on his capital, he must either have a bad farm or bad management, or *the times* must be unfavourable. He ought to make from 12 to 15 per cent. Some farmers make more, when corn is at a fair price.

There are circumstances which may make it advisable to a man, in stocking a farm, to abstain from any system of live stock for the first year, upon soils, the pastures of which admit mowing; and cases in which the gaining a good stock before-hand, of hay and straw for litter, may add to the motives of such delay. In such circumstances, it is prudent to buy the team only; to mow all the grass of the farm for hay, and to stack and thatch safe and securely all the straw: to have such a plenty one year before-hand, is very valuable and convenient, and will afterwards place him much at his ease.

SETTING THE FLOCK.

In stocking the farm, our young farmer will have to determine on the breed and system of sheep. I shall here give one caution, and that is, to be very careful that he do not enter into such expences in buying fashionable breeds, as may cripple his exertions in more necessary objects.

SERVANTS.

This is the time that farming servants are chiefly hired, and the attentive cultivator should consider well before he determines on the number or the quality of his servants. A considerable business requires the employment of a bailiff; and as such a servant may have material effects on the conduct of a business, it is always right in a farmer to consider the nature of his own case well. If his farm is extremely large, if his culture is complex, or if he is absent a part of the year; in these circumstances, the employment of a bailiff may be absolutely necessary; but there are so many sorts of bailiffs, that a man may qualify the measure almost into that of hiring a common servant. In a large farm, his business is to be perpetually on the watch on all the people, of whatever sort, employed; consequently he must not work, which confines him to one place. This part of his employment renders it necessary that he should be of a rank something above the best sort of servants and workmen; for if one from that class has the command given him, he will not be well obeyed. A bailiff should ever preserve a due authority over all the people employed; and, for this purpose, his master would find it very useful to allow him to hire his own servants and labourers, or at least to give him liberty to turn any of them away.

Respecting market transactions, all buying, selling, bargaining, and receiving money, it is highly advisable for the master to do all business of that sort: it is dangerous to trust these servants too much; not for fear of their running away with money; but numerous money transactions, of which it is impossible the master can have an entire check, have at least a tendency to give opportunities of dishonesty, which may have a bad effect; and market meetings, for the transaction of this sort of business, are likewise too apt to hazard the sobriety of a bailiff.

As to other servants, the principal are the ploughmen; for on them depends, in a good measure, the success of all crops. In a large business, it will be very difficult to have all good hands; but a man should aim at it as much as possible; for a bad ploughman makes very indifferent work, but skims the land in an irregular manner, and rice-balks half he goes over.

If no bailiff is kept, you must be more attentive in hiring ploughmen: to choose such as will be obedient without that round of murmuring and complaints so often heard from these men: if they be not docile, you will find great difficulty in having the land managed in the manner you like best. Shepherds, hog-herds, cow-herds, driving-boys, and all other servants, are now hired; and as characters are scarcely ever given among farmers, it much depends on your quick judging of the accounts the fellows give of themselves; and every man is a physiognomist.

Some great farmers board their men-servants and boys with their bailiff: it is one way of lessening trouble, and, with one bailiff in twenty, may be a proper arrangement; but far better for the farmer to have all his people under his own eye: he ought to consider himself as answerable, in some degree, for their religious and their moral conduct; to keep them regularly at their church, and, as much as possible, to prevent all swearing and prophane language, for he may depend on finding servants, thus kept to a decent, orderly, and sober conduct, proving much more useful assistants than an ill-regulated, profligate set: it is to be hoped that our farmer has higher and better motives, but in a mere worldly view, he will soon be convinced of this fact. If he keeps a bailiff of the better sort, and single, there are many advantages in having him eat at the farmer's table.

Is it more advantageous to keep many servants and few labourers, or many labourers and few servants?—Twenty years ago I believe the latter was more profitable, but at present the reverse. The price of day-labour, and the difficulty of getting it, are increased more than the wages of servants and the expences of house-keeping; and there is an advantage, not a trifling one, in the farm-house being made a market for many inferior articles of the farm-produce. The certainty of commanding hands is a great object. However, much will depend on the local circumstances and population of the district; and much on the due regulation of the farmer's family.

FAMILY ARRANGEMENT.

Many accidental circumstances, gradually bring into a certain train the common habits of domestic life; but it would often be more advantageous to lay down a plan to be pursued within doors as well as without: such ideas may not always be practicable, but the mere aim will not be without use. Our young farmer, on entering his farm, must necessarily arrange his plan of life and house-keeping, a subject which should not be wholly omitted, yet admits but a few cursory hints that may possibly give a turn to his reflections, and being properly worked on in his mind, may possibly produce a beneficial effect on his conduct. It is not every man that has the power of thinking to any marked utility; but he whose mind is inquisitive, may think to advantage on every subject. A prudent economy, free from all sordid avarice, will by every one be admitted as right; but it demands some reflection on entering life, or a farm, every day so to arrange circumstances, that they shall flow from the plan adopted; or at least that such plan shall have no tendency to counteract. In regard to house-keeping, the safest way is to assign a stated weekly sum for it, which should on no account be exceeded; an annual one for his own dress and personal expences; the same for his wife and young children. And he should, in prudence, keep the whole allotted expence so much *within* his probable income, as to possess an accumulating fund for contingencies, children, &c. &c. And if he expects the blessing of the Almighty on his industry, he will not forget the poor in such distribution: I do not mean by *rates*, but by *charity:* and this hint demands one observation: a very material evil attending the support of the poor by rates, is the natural tendency they have essentially to lessen, if not to cut up charity by the root; that they do this in many hearts cannot be doubted; but it is a horrible and a national evil. Let our young farmer accustom his mind to very different reflections, remembering that what he pays in poor-rates he is forced to pay, and that it is a part of his calculation in stocking his farm: if he expects to prosper (but not from that motive *only*, or he might as well close his purse) let him so accustom himself to kind offices and assistance to his poor neighbours, whoever they may work with, as to gain a habit of reaping pleasure from his free benevolence.

In such calculations as I have hinted at, he may safely estimate his profit at 10 per cent. on his capital: from 4000l. his income derived from his farm ought to be 400l. a year. He should lay up 50l. and as much more as his better interest may permit. To expend this in *extra* improvements, may be the most advantageous investment, provided he owns his farm, or has a long lease, not otherwise.

To attend markets and a few fairs, is a necessary part of a farmer's business; but to a young man it is a very dangerous part; it is too apt to give the evil habits of drinking and dissipation: evil company is every where to be found; and many a farmer has been ruined by a want of a careful selection of his acquaintance, and by not avoiding the contraction of habits which cannot be indulged with safety. As a safeguard against all evils of this tendency, an habitual attention to the duties of religion will have more efficacy than all the philosophic morality which so much abounds upon the tongues of many: by religion, I mean that of the national church, the most excellent that has been any where established for the instruction of the human species. He can have no true friend that will not advise him to keep the Sabbath piously and strictly himself, and make his family do the same: many a judge has traced the origin of crimes that have brought labourers to the gallows, to Sabbath-breaking; and if the source of failures among farmers were as well explored, they would be traced to the same spring. Serve God on Sunday as you serve yourself on Monday: if you are a pagan, a deist, a moral philosopher, you are, to a certain degree, in reason, answerable for the paganism, deism, or moral philosophy of your children and servants; if a Christian, you are surely the same for their Christianity: you may gain by this, but cannot lose.

The fashionable sheep-shearings, farming clubs, societies, &c. render another remark not absolutely unnecessary: a steady, careful old farmer, may not be the worse for mixing a good deal in company of a much higher rank than his own; but a young man with a small degree of animation, may suffer by it. His eye and mind become insensibly accustomed to objects and habits of living to which he was before a stranger; to steer clear of all imitation is not a very easy task, but it is an extremely necessary one: if, after an excursion which has carried him into great, and what is called good company, he returns home not quite so well satisfied with home as he was before, he has contracted a taint that may be worse than the scab among his sheep. The caustic of wholesome self-discipline becomes necessary. He should guard carefully against one of the most natural propensities, or *his* pleasures (partially assuming somewhat of the garb of business) will prove like the pleasures of so many other classes, treacherous dissipation, and lay a foundation for uneasiness and regret.

Letter to a Friend.—" With a small, but increasing family, you have taken possession of your estate, which, if I understand you clearly, is of the gross rental, including the lands in hand, of about 600l. a year; and that the net receipt, every outgoing paid, is 461l.: this will be your whole dependence, for it cannot be prudent to reckon upon any *profit at present* from the 180 acres of farm which your father occupied, and which you have in occupation.

" The best advice I can give you is, to consider with particular attention how very necessary a steady and unremitted economy, upon a well-matured system, is, for enabling you to live, and bring up a family, in the class of *gentlemen*, upon such an income; and to explain as well as I am able, how much, on such a plan, will depend on your husbandry being rendered gradually so beneficial, as to make a material object to increase it as the several farms become vacant of which your estate consists; a prospect by no means admissible on any other principle than that of your making 180 acres yield an unquestioned *profit* before you take any more, and so proceeding with respect to every successive farm.

"And this observation, as well as all I shall make, ought to rest on your having a just idea of what such an income as 460l. will enable a family, *in such times as these*, to effect; for it is less, I doubt, than you conceive. You must remember the many instances of such estates in my knowledge, and, I believe, in your own, which have been dissipated by their owners (I might almost say without *dissipation*), by their not having a due sense of those increased expences of living, not marked so much by the price, per pound, of necessaries, as by the more luxurious and elegant ideas which have pervaded every class of the people; and which appear in building, fitting up, and furnishing houses; in gardens, table, equipage, dress, pleasures, education, &c. Nothing but a rigid prudence can keep a man in the class he was born in, with any estate that ranks with yours. If you think it possible for you to associate with men of 700l. 800l. or 1000l. a year, upon any thing like equal terms, you must either be ruined, or pay too dearly, through a month's uncomfortable restrictions, for the pleasure (mixed with much trouble) of a day. For want of these reflections, hundreds have been ruined, without vices, without any particular extravagance, and merely by a general notion, that they could go on for the last 10 or 15 years as they did for as many preceding. But the fact is, that the increase of taxes, uniting with the increase of the luxury of men, with money flowing in from very different sources than any enjoyed by country gentlemen of small estates, have doubled, and in some cases trebled the expence of living; so that, if these heavy burthens be not carefully provided for in the first instance, distress, debts, and ruin, succeed.

"Let me then most earnestly advise you, in the first year, to square all your expences to only two-thirds of your sure and certain income. You cannot deduct less than 60l. for taxes not attaching to the land: there remain 400l.; two-thirds of which are 266l.: on no account spend one shilling more.

"Now, you will observe, that this is directly the reverse of what we commonly see. The first year a young couple marry, they make an extra *show*; and the first year a man comes to his estate, he usually makes some addition to, or alteration in his house; or he pulls down walls, throws down yew hedges, cleans about him, and gets into a train of improvements, which it is possible he had been meditating before he came to it. Girt windows, aukward dark passages, windy floors, and a hundred other things, are nuisances; and then friends are ever ready with projects and advice— "*Nothing more palpable; the improvement speaks itself!*

itself!—mighty well! But turn a deaf ear, though the expence be but 5l. When the first year is over, and you have the third of your income, or 133l. *in pocket*, and not a debt upon earth, you may consider what is best to do with it; but to lay out a shilling before you know whether you will have it in a *real surplus*, is, upon system, the conduct which has sent so many little estates the road I hope yours will not travel. The observation is equally applicable to your agriculture: that is a very pleasant employment, and improvements and experiments are very pleasant also; but for one year, at least, go on as your father did, without variation; he was a prudent man, and did not lose; at least know by trial that you *can* go on without loss, before you listen to any proposals of improvement.

"But perhaps it will be said, how are you to live upon 266l.? Firmness and resolution will do any thing; and when the comfort of your whole life is at stake, I am sure they can never be more powerfully called for. You must proceed upon plan. Your own clothes and Mrs. ——'s, and your children's, so much; servants' wages, and all other payments, not for house-keeping, so much. Deduct these from 266l. and divide the remainder by 52: it gives your weekly income. By paying ready money for every thing you will know in seven days if you exceed, and how much, and then can regulate accordingly. Such a systematic method of going on has very little trouble in it, and it is positively safe, which no other way to be devised is. Of all other things, be careful to keep accurate accounts of your expences, under every head, and of your farm, and let them be in effect as well as theory, the basis of experience; they will prove so: but remember all is confusion and danger the moment you have bills, for every thing depends on ready-money transactions of every kind. A prudent man would live on a crust, and go in rags, rather than live on any sort of tick. He lives at a rate of which he is ignorant; he spends—he knows not what: he is subject to imposition; he is in difficulties before he dreams of any; and his life becomes embittered, for want of a few grains of resolution at setting out.

"Another point is, to consider consumption as expence. You have found wine in the cellar, perhaps other things; if you take out a dozen, nay, a bottle, enter it as paid for: by this you will avoid an obvious fallacy. Put the money by itself; it will be ready to replenish.

"Now mark the advantages of such a conduct: at the end of the year you will have 133l. cash in hand. You have had a year's experience; you reflect on a very restricted, perhaps uncomfortable way of living; you may then consider whether it is better to go on so, and expend such a surplus in such improvements as you have observed to be most wanting, or whether it will not be more advisable to live better, and keep other things as you found them. You are the master; you can do either; or you may mix the plans—live rather better, and improve a little; but with such an income, the likely result is, that you will find the expences of living comfortably will leave little for any thing else.

"One thing, however, there is, which ought never to be forgotten—you are a Christian, and I hope a good one, sufficiently to know, that the wants of your poor neighbours are a call, to which he only can attend who lives with economy. If you spend all on yourself and family, what can you do for others? And though your income be small, yet, comparatively, it is very great, and this is a demand which ought never to be waived. None can expect God's blessing, who do not think of this call upon their humanity in the arrangement of expences.

"Let me further urge you most warmly to lay down a plan of expence, at all events, that leaves you some surplus at the end of the year. I do not think that any prudent man should regularly spend more than three-fourths of his net income: such a saving, not for the purposes of hoarding, or growing in any degree rich, is essential to his comfort. If he cannot attain one-fourth, let it be one-sixth, or at least, one-eighth: at all events let it be something: without something free at the year's end, it is impossible he should ever be in tolerable comfort.

"I have heard a right reverend prelate, of great knowledge and ability, declare, that a country clergyman of 300l. a year could not afford to drink wine: the assertion was received with some doubt, not by me, for I believe it is correct, and that calculation would prove it. Your *free* income of 400l. will admit of no excess in any thing, which is easily proved. Suppose we allow 60l. for the dress of yourself and wife, and 20l. for that of your children (being young); wages of two maids and a boy, 15l.; garden labour, 10l.; necessary repairs of furniture, books, newspaper, stable sundries, garden ditto, &c. 15l.; here are 120l.; remain 280l: this is 5l. 8s. a week for house-keeping, medical assistance, charity, and every unforeseen expence; and this with children that are young. There is further to be deducted that saving, which, at all events, is to be looked to in the first instance, be it but the eight shillings.

"Is it not evident, from this account, that such an income must be managed with an economy approaching privation in many articles, or distress must enter? In conversation, an estate of 600l. a year is sometimes talked of in a style that shews the world does not calculate. The gross income has no more to do in such accounts than the income of the Great Mogul; bring it to the net receipt, taxes, &c. paid, and then you will find ground for very different ideas. But these few items are sufficient to prove, that an estate of 600l. a year will not permit its owner to keep a footman, nor any carriage beyond a whiskey, without drawing on a farm in hand, or reducing house-keeping to penury rather than economy. From all which it is sufficiently clear, that such a country gentleman must farm, and with success; or he must be deprived of many very essential comforts of life.

"Such accounts explain to us the reason of little estates being every where swallowed up by large ones. Nineteen young men in twenty, and many old ones also, who come to small estates, are ruined before they are well turned in their new situation; and this is for want of calculating their abilities, examining what they can spend per week, and paying ready money.

"As to your husbandry, you are to remember that this is the only possible means you have of bettering your condition in life: by gradually increasing your farm (but never doing it without the land already in hand being *profitably* conducted), you may very materially improve your income; and by thus advancing in a branch of industry, you take advantage of that *rise of times* which crushes people of small incomes, who cannot advance with the progress of others. As you have no particular pursuit to occupy your time, I do not see that you can have a better than this. Your soil is not the most favourable, but it does not demand any very expensive exertions: the tract being small, you are to remember that great economy and carefulness are necessary, and this upon principle; because a very small loss in labour, for want of attention, by perpetually recurring, will grow into a material object upon the whole year's account. Very many farmers save more than they make; and others, after deducting the value of their own labour, and that of their children, do not make more than a living. Except upon particular soils, it is not a profitable employment of money, compared with many others; and I urge this the rather, that you may be assured it will not answer, unless well followed and judiciously conducted. When I come to you, I will hear what has been the management, and put you in a train that shall be safe and beneficial. I will then talk with you upon what you have written of new Leicester sheep, and some other things, all of which I beg you to postpone not only now, but till a year's account is made up on the present management, that we may know the points in which any change is advisable.——"

The habit of being a guest in the houses of all ranks and classes of the people, not wholly without observation, enables me to form somewhat of an estimate of the nature and extent of the happiness that a man has the chance of in the different paths of life; and I do not hesitate a moment in preferring the life of great farmers. The style of living to which I mean to allude, is this: a large, roomy, clean kitchen, with a good rousing fire on the hearth, and the ceiling well hung with smoaked bacons and hams: a small room for the farmer and his family, opening into this kitchen, with glass in the door, or the wall, to see that things *go right*. When company is in the house, the fire in the parlour; very well furnished. At table, great plenty of plain things, with a bottle of good port after dinner, and at least a hogshead of it in his cellar. The bailiff, if one be kept, dining always at table: a wise regulation, for he may learn something, and he is sure to be put more upon principles of honour and honesty: if he herd only with servants he will partake their nature and feelings: living with his master, he will receive better impressions. Attendance, never any thing but a maid: this I consider as one of the lines of separation between different classes of people: the farmer is to have every thing that yields comfort: those who choose to give up that enjoyment for liveries, or *show* of any kind, arrange themselves with another order of mortals: no farmer who is wise, will ever make the experiment of a change, for he gives solidity for moonshine. On his shelf, some books of piety and common literature: the *Annals of Agriculture* not there so often as they ought to be. In the stable, a good nag for his own riding, but not good enough for hunting; a recreation too common, but not to be approved, as it is apt to lead into a dissipated, idle, drinking, expensive life, The expence of the horse, and the time for the chace, are not, perhaps, very material; but the consequences are uncertain, and sometimes bad. The only country amusement allowable is shooting: and when game is made property, which common sense and general right has long called for, he may, by hiring it of his landlord with the land that feeds it, enjoy this pleasure without any impropriety.

priety. In equipage, he goes no further than a one-horse chaise for his wife.

Such a system as is here sketched, plainly affords all the necessaries, and all the comforts, which the rank, education, and ideas of the persons possessing them have annexed to their expectancy of life: such a probability of certainty and duration as is essential to enjoyment, and at the same time, perhaps, of all the pursuits of industry, the most exempt from unforeseen misfortunes. That the tenour of the pursuit and employment is agreeable to the great mass of mankind, appears clearly, from every rank and class, from a grocer to a duke, making it their amusement. A rich shop-keeper will retire, for pleasure, from his counter to a farm: no rich farmer ever went, *for amusement*, from his fields to a shop.

The particular observations I have made, justify this general idea. I have remarked in great numbers of farmers' families, such a due measure between the intent and the execution; such a harmony between the ideas and the style of living; so little pretension, and so much enjoyment; such a steady preference of comfort to appearance; such a proportion, in regard to the mode of living, between desire and possession, that it is difficult to enter their houses without seeing many marks of happiness, and but few seeds of moral misery: but roll an inquisitive eye through the houses of their betters, and see the fearful space between the objects desired and those possessed; the anxiety for keeping up appearance; the breathless expectancy, and the insipid reality; wounded pride, active envy, and jealous rank—the whole exterior would justify the suspicion, that education was given to people, only to sharpen the ingenuity with which they can make themselves miserable. I never quit the house of a man where the style of life is at all showy, or tending to it, without regretting the folly that buys appearance at the expence of ease.

One of the great miseries of education in these classes is, that little difference is found between that for 1000l. a-year and that for 20,000l. Millions of young men have every possible idea of great expence given them, but with slender means of gratifying the smallest. What ample preparation for future misery!

It may be supposed that a country gentleman has every thing in his power which the farmer possesses, with the addition of a great many other enjoyments. Physically speaking, he has; but as I would judge of life not from theory, but by practice, we must take a view of the generality of country gentlemen, and examine if their desires be *equally gratified* with those of the farmers; for if they pass their lives in wishing or struggling for what they cannot attain, the inquiry is at an end—with farmers IT IS NOT THUS: it is their view of pleasure, and their ambition, to enjoy securely the system I have described; and this system is very generally within their reach. But with all ranks of gentlemen, their views and ambition are directed to the pleasures and decorations of life, which are, in their nature, boundless: objects that recede as you approach—phantoms which fly the grasp in the moment that they seem within reach—liveries—equipage—stables—servants—building—furnishing—gardening—travelling—London—dress—and a thousand *et cæteras.* We perpetually see men surrounded by the comforts of life, and regarding them with apathy or disgust, because some of these luxuries are beyond their reach: we even see them sparing and niggardly in what a farmer enjoys in plenty, in order to make a better figure in these endless pursuits. Thus, it will not be a bad rule, in estimating human happiness, to suppose that where there is most show and splendour, there is least enjoyment; as the train of that expence proves that the master's exertion is in a line where completion is impossible, and moderation difficult. I speak of the general mass of mankind—particular instances may form exceptions, but do not affect the rule. If happiness consist in an equality between hope and gratification, in the approximation of desire and enjoyment, little doubt can be entertained of this comparative estimate of farmers and country gentlemen. And the proof lies in one singular fact: if the farmer increase his income by a greater success in his business, he does not alter his plan of life, but saves. If the gentleman increases his rents, he changes his appearance proportionably. Those who will duly consider the importance

portance of this contrast, cannot long have any doubt upon the subject.

In all this I wish to be general: there are certainly wise gentlemen, and there are foolish farmers: I see sometimes, for instance, a piano-forte in a farmer's parlour, which I always wish to be burnt: a livery-servant is sometimes found, and a post-chaise to carry their daughters to assemblies; these ladies are sometimes educated at expensive boarding-schools, and the sons often at the universities, to be made parsons; but all these things imply a departure from that line which separates these different orders of beings: let these things, and all the folly, foppery, expence, and anxiety that belong to them, remain amongst gentlemen; a wise farmer will not envy them. Education of children is an object of too much consequence to be hastily dispatched, and I mean to give, at some other time, my thoughts more at large on that subject.

It will be obvious to every reader, that there are many professions in which industry is exerted, that partake of the farmer's advantages: such are to be found in manufactures and commerce: but not to dwell upon the points in which these are manifestly inferior, I shall only observe, that the largeness of their capital necessarily arranges them in a class by themselves. The sum which will place a farmer at his ease, is lost in trade or manufacture.

Suppose the land 500 acres, 4000l. or 5000l. will stock it, and set the occupier a-going, so that his wheels shall turn smoothly for life. Such a sum is nothing in commerce, unless in the hands of a curmudgeon, who, from having swept a shop, becomes promoted for qualities sometimes estimable; but sometimes such as ought to have conducted him, with poetical justice, to the gallows.

CONNECTING CERTAIN TRADES WITH FARMING.

There often appears among farmers a great disposition to embark in various species of trade, manufacture and commerce. If money is left them, or otherwise acquired, it is no uncommon spectacle to see them invest it in commercial plans. It is seldom wise or prudent thus to engage in pursuits in which they are, probably, very ignorant. There are not many branches of trade that combine well with a large farm. Upon account of the manure which is raised, an inn is admissible, if a man can bring himself to relish the employment. A manufacture of potash, for the same reason, may be very beneficial. Considerable carriers are usually great farmers. Malting unites very well with a farm. But, in general, commercial speculations demand much caution, and no slight consideration, before they are engaged in. Some great farmers in Norfolk have, of late years, built ships in the nearest sea-ports, for carrying their corn to London, and they have also employed them in bringing oil-cake and other manures; but when these are done, it is necessary to employ such ships in other branches. A compting-house at the port is necessary, and the ships demand trade on speculation to be fully employed: buying coals and corn, &c. if upon commission, may be safe, but the business may easily become a state of temptation and great hazard, in which a certain portion of keenness and ability may succeed: but the practice is not to be recommended.

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GENTLEMEN'S FARMING.

A slight observation should here be made on one particular scale of business, adapted to a country gentleman with a small income, who wishes to occupy a farm for mere convenience. In such a case, what should be the scale of it?—I will suppose, in order to give some answer to this question, that he would keep three horses, two for the chaise and one for the saddle; three or four cows, with a few sheep, pigs and poultry: the two coach-horses to do the work of the farm. This system would arrange well with 40 acres arable and 20 of grass; and if he has five acres for a season, he must have a course of eight years. For instance: 1. Turnips or cabbages; 2. Oats; 3. Clover; 4. Beans; 5. Wheat; 6. Carrots and potatoes; 7. Winter-tares and buck-wheat; 8. Wheat. And the days' work in tillage would be: in *January*, none. In *February*, scarifying, harrowing, and drilling beans, four days. In *March*, scarifying, harrowing, and drilling oats; and ploughing for carrots and potatoes, 18 days. In *April*, ploughing for turnips, five days. In *May*, ditto, five days. In *June*, ditto, and ploughing tare-land, 10 days. In *July*, none. In *August*, none. In *September*, putting in five acres of wheat, and five of tares, 15 days. In *October*, the same, and ploughing up potatoes, 13 days. In *November*, ploughing for beans five days. In *December*, ploughing for turnips, five days. Hence, there would be good time for all carting, and yet leave as much for the use of the chaise, as a family of small fortune should desire.

THE FARM ACCOMPTS.

In the arrangement of the business of a farm, this is an object of no inconsiderable importance; the modes of keeping them are almost as numerous as there are farmers in the island. The most plain and simple method commonly used, is that of entering all payments on one side of a book, and all receipts on the other, and balancing when the transactions of the year are ended: and this method gives a tolerable idea of the single object of profit and loss. I say *tolerable*, for it is but a tolerable one. In the ensuing month I shall consider this object more particularly.

FARM-YARD.

This may be the last month of cattle remaining abroad, and if so, the farm-yard should be in order to receive them.

Good and convenient yards are of such great importance to spirited husbandry of all sorts, that, in the hiring a farm, a man should attend to this point, but if he finds himself on a farm where it has been neglected, and that the advantageous circumstances of a new one more than balance the expence of alterations, let him determine to remedy the evil himself, which may generally be done at no great expence. Let him run a high, warm fence, about a piece of ground large enough for all his cattle, contiguous to the barns and other buildings. It will pay the expence of good pales very well; but a much cheaper fence is, to build a stack of stubble, fern, ling, or straw, about eight or nine feet high, and five or six wide, and to thatch it for preservation: no fence is so warm for cattle. This enclosure he must gravel or chalk at bottom, to keep it always firm, and hard enough to shovel up earth or dung. Throughout the leisure times of the summer or autumn, a layer, one to two feet deep, of marl or chalk, turf, ditch-earth, peat, &c. should be spread in it; and upon that layer the cattle may be foddered with straw, hay, &c. all winter. Plenty of stubble, fern, or straw, constantly spreading as fast as they tread it into dung, or lie wet or damp: the stables, cow-houses, hog-sties, fatting-stalls, if any, should be cleaned on to it; and if the farmer fats any beasts on turnips, he may give them in binns in such a yard; by which means the quantity of dung he will raise will turn out immense, provided he has plenty of litter.

THE TEAMS.

About the latter end of this month, the horses must be put to dry meat; that is, hay, oats, and chaff. The hay should be given them cut into chaff with straw: as to oats, if the horses are worked constantly, they should be allowed two bushels per horse per week, which will be no more than sufficient to keep them in good heart, and make amends for the loss of lucern: with this food they may be worked regularly.

But this system of feeding is expensive, and there is a way to lessen the cost, which is by substituting carrots instead of oats, or, at least, instead of the greatest part of the oats. If you apply the chief of your carrot crop to other purposes, still you should determine to allow a small quantity weekly to all your horses, for the mere purpose of keeping them in good health.

HORSES OR OXEN.

In stocking a farm, the question, whether to employ horses or oxen, or both, will necessarily demand the farmer's attention. If he lives in a country where both are common, he will, probably, from practice, have fixed his ideas sufficiently for the regulation of his business; but if he live where horses only are known, he may be inclined to try oxen, in which case some practical observations on the subject may not be useless, from one who has had many years experience of both, and of bulls also.

There are two cases in which oxen are certainly more beneficial than horses; first, when a farmer lives in a district where there is a breed of cattle well adapted to work; and, secondly, when his farm is so large that he can buy in a considerable lot of cattle annually, at a small expence *per head*, and feel no inconvenience in turning out such beasts from the teams to fattening, as do not work well. In both these cases I have little doubt of the superiority of oxen to horses. But in countries that do not possess a breed of cattle well adapted for work in the state of oxen; and on small farms whence fairs must be attended perhaps at the distance of an hundred miles to purchase a few, and consequently at a great expence per head, and possibly without land for fattening any, the benefit will be very questionable. In such a case I should prefer the bulls of the country, which are every where to be procured probably much cheaper than oxen; are broken in with but little difficulty; which work well, and which will recover from fatigue sooner than any ox. This, I believe, from what I have experienced, and from all the information I have procured, is stating the question of the comparison of horses and oxen as nearly to the truth as it can be done, in few words. There are, however, some works in the business of a farm, in which horses are better than either oxen or bulls, and therefore it may be advantageous to keep a few horses.

The ox teams should this month be kept on straw and cabbages, and, in default of the latter, on turnips; but cabbages are superior. Let them have hay or good straw always in their racks.

COWS.

The dairy of cows, supposing the system of the farm to be field-feeding, are now to be taken into the yard, where their food must vary according to their state: the dry ones must be put to cut chaff, and those in milk in another yard, to cabbages, which are found, on experience, to give no disagreeable taste to the milk; but good chaff must be given with them. Young cattle should be put with the cows in milk, as they cannot be kept too well. On no account let any of these cattle out of the yards: they only poach and damage the grass fields. And let it be remembered, that the grass now to be had in meadows and pastures, suitable to kept rouen, is of far greater value for sheep in more pinching seasons.

Such cattle as have been in the yard or sheds, and supported by soiling, may now have their food gradually changed to dry meat, roots, or cabbages.

FATTING BEASTS.

This is the proper time to take the large fatting oxen, that have had the summer's grass, and put them to turnips, cabbages, or carrots: turnips with cut chaff will do; but not near so well as cabbages or carrots; both which will fat a large ox as well as any food. You may either stall-feed them under cover, or let them be loose in a straw-yard, well littered in either case: and if the latter, they should have open sheds to retire under at pleasure.

This is also the month for purchasing beasts of the smaller sort, for fatting on the same articles of food, particularly turnips and cabbages. It is this plan of appropriating the turnips and cabbages of a farm to fatting beasts throughout the winter, in a well-littered farm-yard, that converts the straw, fern, stubble, &c. into such quantities of dung as improves the land more than any other method whatever.

The quantity of turnips and hay which stalled oxen eat, appears from experiment to be a ton of turnips, besides chaff or hay, in a week, for an ox of 75 stone (14lb.); 12 cwt. a week for a cow of 32 stone, with variations of course.

HOGS.

Now also put full-grown hogs to fatten: a business profitable, particularly in respect to the improvement of a farm by dung. If he gets the market price for his pease, barley, beans, buck-wheat, &c. and saves carriage upon them, at the same time getting a fair price for his swine, lean, he certainly makes a considerable profit upon the whole transaction, though not an immediate one, as the mere fattener of hogs; but what is of much greater consequence, is the raising of rich and most valuable manure.

The most profitable method of converting corn of any kind into food for hogs, is to grind it into meal, and mix this with water in cisterns, in the proportion of five bushels of meal to 100 gallons of water: stir it well several times a day, for three weeks, in cold weather, or for a fortnight in a warmer season, by which it will have fermented well and become acid, till which time it is not ready to give. It should be stirred immediately before feeding. Two or three cisterns should be kept fermenting in succession, that no necessity may occur of giving it not duly prepared. The difference in profit between feeding in this manner, and giving the grain whole, or only ground, is so great, that whoever tries it once, will not be apt to change it for the common methods.

Pease-soup, however, is an excellent food for hogs, and may, for what I know (but I have not sufficiently compared them), equal the above, especially if given in winter, milk-warm; but the expence of fuel and labour must be remembered.

For the general stock of hogs, cabbages are this month of incomparable use. Swine at this season are often very cheap, and it is of material consequence, in that case, that the farmer be largely provided with a food, by means of which he can keep this stock for a better market. Without this plant, he cannot keep great stocks of swine to the best advantage.

PUT FAT SHEEP TO TURNIPS, &c.

This is the proper time to begin to feed off the forward-sown turnips. A general rule which ought rarely to be departed from is, not to begin to fat lean stock on this food; they rarely pay for it. Sheep should be nearly half fat when they begin turnips; nor will they feed to profit if lean. I have made the comparison repeatedly, with the same result. Upon every soil that will bear it, the turnips ought to be eaten, by hurdling, where they grow, for to draw them, unless absolutely necessary, is most unprofitable management. A lean stock should follow, to eat what the fat ones leave.

MANURE GRASS.

If this was omitted after mowing, it should not be deferred later. In some counties, it is an article in the generality of leases, that all, or much of the dung of a farm, should be spread on the grass; but such covenants are contrary to the spirit of good husbandry.

DIG UP CARROTS.

About the end of this month the carrot crop should be dug up: some persons leave it till November; but, in case of wet weather, they suffer. They may be taken up either with three-pronged forks or with spades, if the land is not hard, which will not be, if the crop has been well cultivated: a little loosening of the earth with the tool, and at the same time drawing up the carrot by the top, will take them up very quickly. They should be left spread over the field till dry, which will be in a day or two; then thrown into heaps, and carted home; which moving will clear the dirt from them. Unload them in a barn or some out-house, and let the tops be chopped off, and given to the swine; then lay the roots where they are to remain. Some pile them up in a heap, and cover them with dry sand; others cover them with straw: they will keep very well, if packed close together in any building; and if it be only a boarded one, cover them with some straw, enough to keep out the frost. There are many ways of preserving them; one is, to pile them in a circle, finished conically, with just a scattering of tops left on a few of the outside carrots, as shall form a thin thatch of tops hanging down: not thickly, for the tops will then ferment, and heat the roots: if these few tops rot away, a thin scattering of straw should be laid, and the pile be not more than five feet diameter. Others put them in a ridge of earth, like potatoe *pies.* The general way in Suffolk is, to leave them in the ground, and take them up as wanted; but this is applicable only to a district where every man has a field, else they would be stolen. From 1s. 6d. to 2s. a load of 40 bushels, are given for taking up.

Respecting the application of the crop, much has already been said on that head. They are to be given to the team; if without oats, two bushels per horse per diem; and they will eat but little hay: they are of incomparable use in fattening oxen, and in feeding stock swine. Sows that have pigs may be kept on them, for they breed much milk. Cows eat them greedily, and they give no ill taste to the milk, cream, or butter. Their use, in short, is universal; you can cultivate no plant that will answer more purposes.

PLOUGH UP POTATOES.

There is not the same reason for digging up this crop as for carrots: the plough among the latter is apt to cut, break, and bury them; but not so with potatoes, for it turns them over, damaging scarcely any. First, let a number of women, preceded by a cart, pull up the tops, and throw the potatoes that adhere to them into baskets, and the stalks into the cart, which should convey them to the hog-yards, where they will presently be trampled into dung: then each plough taking its ground, attended by six or eight women, or more, if the crop is very large, each with a basket, divide the furrow, by setting up white sticks into as many parts as there are women, that each may pick her own share; a range of bushel skeps, at a small distance, for the baskets being emptied, and three or four carts ready for men (who do nothing else), one to eight or ten women, to take the skeps to the carts. The furrow being picked, I used, many years ago, to work it by men with three-pronged forks, each with a woman, or a boy, to pick up the roots; but finding this expensive, I contrived a diagonal harrow in a shim beam, with two or three teeth, drawn by one horse, which tears the furrow in pieces, and lays bare the mass of the crop: the women then pick again; and another common cross-harrowing, with a second ploughing and harrowing, all three attended with two women to each plough, will finish the business, and clean the roots all away; so that I have found the pigs, when let in, make but very poor gleanings. The use of the little harrow saved me from 14s. to 20s. per acre in labour.

The best way of storing the roots, is in what are called potatoe *pies*. A trench, one foot deep and six feet wide, is dug, and the earth clean shovelled out, and laid on one side: this has a bedding of straw, and the one-horse carts shoot down the potatoes into the trench; women pile them up about three feet high, in the shape of a house-roof; straw is then carefully laid on six or eight inches thick, and covered with earth a foot thick, neatly smoothed by flat strokes of the spade. In this method I never lost any by the severest frosts; but, in case of its freezing with uncommon severity, another coat of straw over all, gives absolute security.

These pies, when opened, should each be quite cleared, or they are liable to depredation. To receive one at a time, besides also being at first filled for immediate use, I have a house that holds about 700 bushels, formed of posts from fir plantations, with wattled sides, then a layer of straw, and against that earth, six feet thick at bottom and eighteen inches at top: the roof flat, and a stack of beans built upon it. This I have found frost-tight. The beans keep out the weather, and yet admit any steam which rises from the roots, which, if it did not escape, would rot them.

LAY UP THE FALLOWS.

This month must conclude the autumnal tillage on stiff or moist lands; for in the following, they may probably be too wet: but on very light sandy soils, ploughing goes on all winter. Lay it down as an invariable rule, never to have a piece of stubble unploughed at the end of November. It is of importance, to leave the land for winter in such a manner that the frosts may get into it.

But here our young farmer's attention must be particularly turned to the greatest of all modern improvements on strong land; that of discarding as much as possible all spring tillage: the summer fallows intended for barley and oats; the bean, pea, and tare stubbles designed for the same crops; and the white corn stubbles intended for any spring crop, must now be ploughed very carefully, being the future seed-earth; no more ploughings being allowable on any account whatever. In the Calendars for February and March I have entered into some explanations of this system, which is of such importance, that too firm a resolution cannot be taken to carry it into execution. By means of it the crops are much greater, and the expences considerably reduced. The leading principle is this:

if the land is so laid in autumn, on to ridges of that exact breadth which suits the tools (whatever they may be, whether harrows, scarifiers, scufflers, or drills), so that the horses which draw them may walk only in the furrows, the frosts will have left so fine and friable a surface, that any of these operations may be performed long before the land in the common system could be ploughed. The seed is securely in the ground before the old-fashioned farmer thinks of moving. If he ploughs, he turns down a dry crumbling surface, and brings up the stiff wet *clung* bottom: if rain comes, then he is in the mire, and must wait for a season: if a drying sharp north-east wind comes, his furrows are converted to oblong stripes of a stony hardness. In one case he is plagued with mud, in the other with impenetrable clods: he was possessed of just the surface he wanted, and which, once lost, is not often regained. This surface may be scuffled, and immediately drilled securely. If this husbandry be intended, it is of particular importance that the lands or stitches be laid out with great exactness. See the Calendar for the spring months.

A caution in the first forming of these stitches should be mentioned; which is, the difficulty, without two or three ploughings, of bringing them from old breadths into a correct form. If the men are not skilful, they raise the centers too high; and, in reversing, are apt to leave the outside furrows also too high: the stitch should be flat, or, if rounded, very slightly so; without this attention, the seed in some drills will be deposited deeper than in others.

SOW WHEAT.

All the cases of sowing this grain in September, are equally applicable to October, if the weather was too dry in that month. October is the principal month in the year for putting in wheat throughout the kingdom, and it is every where partly performed in this month, though some like to postpone it to November. The management is, however, bad, should the season suit in October.

SOW WINTER TARES.

There should be two sowings of tares in this month, as it is a material object to have a succession for soiling.

MANURE AND PLOUGH FOR BEANS.

A successful bean husbandry upon harsh and difficult soils, depends upon the exertions which are made in this month, or, in favourable weather, in November. As soon as the farmer has finished his wheat-sowing (and before, if he has been delayed by drought), he should cart on the manure, all that is possible for beans. It is the wheat, barley, or oat stubbles, or layers, which will come in course to receive it: if the wheat, the stubble must be mown and carted first; the manure then carted and spread, and the land carefully ploughed into that form on which the crop is in the spring to be drilled or dibbled. If the former, the stitches must be of the exact breadth which suits the drill machine; if the latter, of that which is adapted to the scuffle and scarifier. The dung will lie safe, and the frosts will pulverize the surface, a main point for drilling, but not for dibbling. By means of effecting this before the bad weather comes, he will be able, if the weather be open, to get in the crop in February, which is of much importance. Let him be assured that there is no crop which will pay him better for dung than this.

PLOUGH FOR PEASE.

On the same principle which governed the preceding observation in relation to beans, he must now plough the lands intended for pease; laying the stitches of the breadth which will suit the drill-machine, or for dibbling them on layers. But the manure should be applied to other crops.

PLOUGH FOR BARLEY AND OATS.

Whatever lands are intended for these crops (except such as are now under green winter ones), should be ploughed, as remarked in the preceding articles, in this season for the seed-earth, in order that no ploughs may be wanted to stir on wet land in the spring. Attention is to be paid very carefully to the breadth of the stitches, that the mode of putting in these crops may be duly prepared for. See the Calendar for March. No reasonable man, who

who has seen the effect of this system, can value the modern improvement at less than the rent of the land.

PLOUGH FOR MADDER.

This is the right time to give the first stirring to the land designed for madder. It requires great depth of ploughing. Loams, that in common conversation are called clays, will, with a proper quantity of dung, do for madder. The article of manuring is the soul of this culture; the plant delights to grow in a dunghill, so that you need not fear over-doing it.

Let the farmer, however, determine to have nothing to do with this, or with any crop not in an easy and safe mode of sale, unless he has previously ascertained the certainty and price of the market.

DIGGING FOR LIQUORICE.

The best culture for this root, and which is common at Pontefract, is to dig for it four or five feet deep. This plant sends down only one tap-root, like the carrot; consequently the great profit of it is the length of the root, which is exactly proportioned to the depth of the tillage. In this husbandry, as in that of madder, the same land is preferable for successive crops, as one digging serves both for the old crop and the new. For liquorice you must manure very richly: it will not answer well without this attention. Leave the land well water-furrowed for the spring.

COURSES OF CROPS.

I esteem this to be the most important subject that has been treated of by the modern writers of husbandry, and that on which they have thrown far more light than upon any other circumstance in agriculture. It is a very singular and remarkable circumstance, that before the reign of his present Majesty, notwithstanding the multitude of books on Agriculture, there is not one author who had any tolerable ideas upon this subject, or even annexed to it any importance. They recite courses good, bad, and execrable, in the same tone, as matters not open to praise or censure, and unconnected with any principles that could throw light on the arrangement of fields. But, when once the idea was properly started, its importance presently became obvious, so that thirty years have carried to great perfection the precepts which practice has afforded in this branch of rural economy. This subject will demand a principal attention from our young farmer, who should well consider the courses to which his soil is applicable.

General Principle.—It is now well known that some crops exhaust land much more than others: that some, notwithstanding they exhaust, return, by being consumed on the farm, as much, or more, than they drew from the soil in their growth: that some admit profitable tillage and cleaning while growing; and consequently, clean, instead of rendering the land foul with weeds; while others, not admitting such tillage, and being exhausters, if combined in succession, will deteriorate the land and fill it with weeds. Practice tells us, that by a due arrangement of these crops in courses, land of almost any description may be kept perpetually clean and in heart.

It will be useful to detail some of the best courses adapted to the most striking varieties of soil.

First, including a fallow on strong and wet land:

1. Fallow,
2. Barley,
3. Beans,
4. Wheat,
5. Tares,
6. Barley,
7. Clover,
8. Beans,
9. Wheat.

1. Fallow,
2. Barley,
3. Clover,
4. Beans,
5. Wheat,
6. Cabbages,
7. Oats,
8. Tares,
9. Barley.

Excluding a fallow on good sound loam:

1. Turnips,
2. Barley,
3. Clover,
4. Wheat,
5. Cabbages,
6. Oats,
7. Tares,
8. Barley,
9. Beans,
10. Wheat,

1. Turnips,
2. Ruta Baga,
3. Barley,
4. Clover,
5. Beans,
6. Wheat,
7. Beans,
8. Wheat.

On good sand:

1. Turnips,
2. Barley,
3. Carrots,
4. Barley,
5. Clover,
6. Wheat.

On peat, and on soils long harassed by corn:

1. Coleseed, or Turnips,
2. Ditto,
3. Oats,
4. Ruta baga,
5. Barley,
6. Grasses,
7. Ditto,
8. Grasses,
9. Ditto,
10. Potatoes,
11. Barley,
12. Tares or Pease,
13. Barley and Grass.

On dry and calcareous soils:

1. Turnips,
2. Ditto,
3. Barley,
4. Sainfoin for ten years, and upwards; then pared and burnt for,
5. Turnips,
6. Barley,
7. Pease,
8. Wheat.

THE DRILL HUSBANDRY.

Upon settling his farm, our young farmer has, among many other objects that require his attention, to determine in what degree and for what crops he will adopt the drill husbandry. It has long been known that this system is applicable, without inconvenience, to sandy soils and to dry loams, which may be safely laid flat, and accordingly, on such it made a great and rapid progress in Norfolk; but it travelled no further in that county. A great revolution which has taken place in the wet land district of Suffolk, has introduced it with equal success on the strong soils of that county.

This great change is the banishment of the plough, to as great a degree as possible from heavy soils in the spring; all barley, oats, pease, and beans, that can by any means be thus managed, are put in on an autumnal ploughing, which has thrown the stitches very carefully ploughed to the exact breadth which suits either one movement of the drill, or a *bout* of that tool; according to the system the farmer is in, some preferring one and some the other. The frosts give a considerable friability to the surface, so that the farmer can go on very early in the spring, and after one scarifying and harrowing, drill the corn without a horse's foot treading any where except in the stitch furrows.

The advantages of this system are beyond conception. In the common husbandry of giving two or three spring ploughings, or even one, that friable surface the gift of the atmosphere, is turned down, and in eight seasons out of ten lost, to be had no more. Successive rain and sharp N. E. winds give a succession of mire and clods, to the material delay, expence and vexation of the farmer. His crops suffer greatly, and he is generally *in the afternoon* of spring operations.

The improvement is applicable to the broad-cast system, as well as to the drill; but as it was introduced, I believe, by those who had been in the habit of drilling wheat, they applied it to drilling barley and oats. It removed at once the main objection to this part of the system, and has been pursued with very great success by the best farmers on the strong lands of Suffolk.

Turnips *fed late* will in some seasons cause an exception, and render one ploughing necessary.

The main objection to drilling being by this circumstance done away, there remains no reason for any farmer, on a soil where the drill machine can freely move, rejecting the husbandry; and he certainly ought to apply it in such cases as it is better adapted to, than dibbling, which, however, never made any progress for barley.

Upon soils of such tenacity as deny effect to hollow drains, the system of drilling must be different; such soils must be laid on round high arched ridges, and to drill these to advantage will demand a machine made for the purpose.

RIDGES, STITCHES, OR LANDS FOR DRILLING.

Drilling, if performed on ridges, demands those of various breadths, according to the system intended to be pursued. Some farmers prefer such as admit but one stroke or movement of the drill-machine; others prefer a *bout*, or two movements. Suppose the machine sows six rows at one foot; that one foot be allowed for the ridge-furrow, and that one movement is preferred: in this case, the ridge must be six feet wide, always measuring from centre to centre of the furrows; but if eighteen inches be allowed for the furrows, which will make better work, then the ridges must be six feet six inches. Two movements of the machine will demand in the former case eleven feet, and in the latter, thirteen feet six inches; and thus, in all other distances, the measure is ascertained on the same principles: but where, from the dryness of the soil, the ridges are ploughed to a great breadth, or the land quite flat, as in Kent, without any lands or ridges, the more common method is, to drill across the path of the plough by means of a marker attached to the axle-tree of the machine, and moved at turning on the head-land. The most correct work I have seen in this way, was not by leading the horse, but by a boy riding him, and keeping the mark always between the horse's ears.

Another system of drilling has been recommended, which is that of double rows at nine inches, on three-feet ridge, which may do for beans; but I never heard of its being attempted in Suffolk for barley or oats, though that ridge is very common there; and all I conversed with on the subject, condemned it in opinion; but for cabbages in single rows, to be drilled in April, these ridges are of the proper breadth.

STANDING SHEEP-FOLD.

This being the month for mowing wheat-stubbles, it is proper to mention the great advantages which attend one application of the haulm thus procured: it is that of forming one or more standing sheep-folds for winter folding, especially in the lambing season. This is the best, and indeed the only admissible system of folding on farms not particularly open.

"In the autumn of 1785 I inclosed a double fold with 13 dozen of old hurdles*, and raised a haulm rick round them, with 60 loads or upwards of wheat stubble, and littered the bottom with about 30 loads more, for my flock to lodge in, in wet or hard frosty weather, when the field-fold was unfit to be laid in, or could not be removed from place to place, on account of such frosts, or deep snows.

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* The hurdles in this neighbourhood are seven feet in length, made with wands.

"I had very good reason to be pleased with the result, for what with the haulm the fold was first littered with, and many loads of short straw carried out of the rack or farm-yards, at different times in the winter, that had first been picked over by great cattle, who had too great a plenty to tread it properly to dung, I raised, including about three inches of earth at the bottom of the fold, 493 loads of manure the first year: valuing this at 1s. per load only, it comes to 24l. 13s.; from which I can deduct nothing for carriage of straw, &c. because the lands about the fold lying at too great a distance to receive any benefit from the home dung, the manure made *there*, is of more extra value than the carriage of such straw or haulm amounts to: this circumstance, with the advantage I found in my flock, induced me to continue the practice. The next year turning out more open and dry, and the frosts of no long duration, the sheep lodging less in the standing fold, and it being likewise a scarce year with me for straw, I did not make more than half that quantity; but having last autumn (1787) a large quantity of coleseed straw, and rye and wheat stubble, I repaired the haulm ricks with 60 loads of the latter, and littered the bottom with about 30 loads of the former, and made a haulm stack in the middle besides, of 40 loads more, for the shepherd to litter with occasionally; so that folding there a great deal this winter, I expect as many, or more loads of dung, than I had the first year; and which being quite a new manure to the adjoining lands (which I observed before, are too far from home to receive any benefit from the farm-yard), I find answers extremely well.

"In addition to the account, let me observe, that before I thought of this scheme, in bad weather the sheep used always to lie on one certain sheltered part of the heath, where the folding was not only lost, but the grass, by being over-manured, was so coarse and sour, that nothing would eat it: besides this damage or loss, in a wet or severe season in yeaning time, I used to lose a much greater number of both sheep and lambs, for want of such dry warm lodging, than I have done since: this difference only, my shepherd estimates at not less than 30 lambs in a year, besides sheep, which, in the time I have been in business, amounts to more lambs than I in general rear in one year; therefore I have to regret that the thought did not come across me at my first entering into business, as, counting every circumstance, I am of opinion it is at least 30l. or 40l. a year advantage to me.

"I cannot help observing how applicable this practice is to a Norfolk farm, where the stubble is generally ploughed in; a method I utterly disapprove, for, in dry seasons, it oftener does, on such soils, more harm than good; and it certainly is very beneficial to convert it to dung.

"I have this year, at the request of my shepherd, lodged my sheep in one of the folds only, which he finds large enough, and sown the other with coleseed, which, from being so well manured, is very stout and fine, and which we find of infinite service this yeaning time, to turn in some weak sheep that have twins, till they get a little strength; or for a sheep which, having lost her own lamb, requires to have another put to her. And here I will remark, that we find by experience that coleseed, called likewise *coleworts*, forwards couples a great deal faster than turnips; winter tares, rye, or forward grasses, the same; and no farmer, I believe, who consults his own interest, would confine couples to turnips, if he could procure a sufficient quantity of either of these other foods for them, which, however, in backward seasons, cannot be done; so that the great dependence for winter and spring food for a flock of sheep, must be on a crop of turnips.

"I purpose, after I have carted out the dung, about Midsummer next, to sow the other fold with coleseed, and to continue changing them alternately.

"The above fold is on a piece of land by the side of my heath, so as to be easily got at from any of the shiftable fields; it is likewise very conveniently situated when we are obliged to give the flock hay, being near a dry warm part of the heath, where we generally distribute that food; and I have of late years made it a rule, to set several small stacks or cocks of hay, of four or five loads each, on different parts of the heath, for that purpose, so that the shepherd can always feed them from that which is most under the wind, and he and his page carry it about themselves, without the assistance of any other help."—*Macro, Annals.*

COLLECT LEAVES.

In woodland countries, it is of great advantage to rake up all leaves that can be procured at a moderate expence, and cart them to the yards and standing folds, for littering and making them into dung: I do it at 3d. per one-horse cart-load. They do not rot easily, but that is no objection to them; they are a sponge to be saturated with urine, and if not touched previously to carting on to the land, will convey to the field much of what might otherwise be lost; and they are extremely useful in aiding the main object of bedding the yards.

DEPTH OF PLOUGHING.

Our young farmer, on entering his farm at a season when the ploughs will be all at work for various purposes, will necessarily have the question of depth come often across his mind; and it is a subject that will demand no trifling attention. In some of our well cultivated counties, the shallowness of the ploughing is remarkable: when almost every other point of management is very spirited and complete, a deficiency in this may not be at once perceived in the crops; but I have no doubt but failures

lures are often caused by it, though attributed to other circumstances. It is a subject too ample, fully to discuss in a work of this nature; but the following hints may have their use.

1. An additional depth should first be gained in autumn, that a successive change of seasons may take effect in atmospheric influences, before any seed is ventured in the raw stratum brought up.

2. The quality of that stratum should be examined; it is sometimes sterile by reason of an acid, discoverable by boiling in water, and putting that water to the test of blue infusions.

3. Animal and vegetable manures cannot be *buried:* at whatever depth they are deposited, their constant tendency is to rise to the atmosphere.

4. Fossil manures are extremely liable to be buried, having a constant tendency downwards. Chalk, marl, and clay, are sufficiently soluble, or so miscible with water as to sink in a regular mass, and are sometimes found much below the path of the plough.

5. In soils of a poor *hungry* quality, there should be some proportion observed between the depth of ploughing and the quantity of manure usually spread; but this does not hold good upon better soils.

6. Soils are rarely found that ought not to be ploughed, in common, six inches deep; many ought to be stirred eight inches, and some ten.

7. One deep ploughing (to the full depth) should be given once in 12, 18, or 24 months; if this be

secured, shallow tillage by scaling, scarifying, scuffling, shimming, or broad sharing, is in many cases preferable to deep working oftener, and especially for wheat, which loves a firm bottom.

These hints are enough to make a farmer *think*, which is no inconsiderable point gained.

GATHER APPLES AND PEARS.

These crops are now ready to gather: they should be taken from the trees in a dry season. Some persons keep them some time in heaps to sweat, before they are deposited where they are to remain. The safest place is a bricked vault, with broad shelves around, in order that they may not lay too deeply disposed. They should be examined for about a month, and moved and wiped if any moisture adheres. This is easily done, if one space is left unoccupied when the cellar is filled.

PUT RAMS TO EWES.

Of all the systems of barbarity in relation to sheep, there is none more prominent than the management, almost every where common 20 years ago, of turning a number of rams promiscuously into a flock of some hundreds of ewes. Where breeding is pursued on enlightened principles, much attention is given to the choice of both ewes and rams, in selecting the lots of the former (50 to 60 in each) and in assigning the latter to the respective parcels. I have been present with that excellent farmer, the late Duke of Bedford, when he attended to this business; he had every ram, with the lambs got by him the preceding year, in distinct pens, that he might not only examine the ram himself, but also his progeny, before he determined what ewes to draw off for him; and the conduct is perfectly reasonable: such attention, united with a careful selection of cull lambs, must keep a flock in a state of progressive improvement, proportioned to the accuracy of judgment, eye, and hand of the farmer who practises it.

NOVEMBER.

THRASHING.

AS soon as the cattle are taken into the yards, if they are to be fed with straw, the thrashers must be set to work, to supply the lean beasts, and they must be kept regularly to it.

FENCES.

This is the first month for hedging and ditching: October is too soon. After you have once brought your fences into good order, which should always be effected within the three first years of a lease, the best way is to divide the length of hedging into 12 parts, and to make it a rule to do one-twelfth every year afterwards; by which means the whole will always be kept in good order. The best method for all old hedges, consisting not wholly of white thorn, is the plashing, in which so much of the hedge is made of live wood, that it holds up and lasts far longer than hedges made all of dead wood, which is the practice of some countries; they are rotten, broken down, and gone, before the quick wood gets up to form a fence; whereas, in the plashing method, by leaving as many hedge-stakes alive as possible, and by laying down much growing wood, the hedge is constantly impenetrable.

BORDERS.

The borders in many counties, where the enclosures are small, take up a tenth or a twelfth part of whole arable farms; but in all enclosed counties, they occupy a great space. It is highly expedient that such land, as it cannot be applied to the profit of the fields themselves, be reduced as much as possible; that is, be no wider than requisite for a horse to turn at the end of the furrow in ploughing; but in many farms this is no rule, and borders over-run with rubbish, such as thorns, brambles, thistles, and other trumpery, spread into the fields, to a width that usurps a quantity of land which ought to be appropriated to more profitable purposes.

FOLDING.

If folding be the system pursued, and this month proves wet, you must leave off for the arable lands and begin with the dry grass fields. Many farmers stop about this time for the winter; but that is bad management: the idea that winter folding is of but little use is a mistake. Winter is a proper season for manuring grass lands which you could not fold in summer; nor does winter folding on very dry grass land do such harm to the sheep as arable folding, and the benefit to the land is great. You may manure mossy ground often, before you destroy that weed; but the treading of the sheep at the same time that the dung and urine are dropped, completely destroys it: and this manuring is more adapted to turf, than dung to be spread on the surface, which is troublesome to get in.

WATER MEADOWS.

In this month you may begin to winter water the meadows and pastures, wherever it can be done; and be assured that no improvement will pay better: a winter's watering will answer in the hay, fully equal to a common manuring of the best stuff you can lay on the land; and the expence, in some situations, is trifling. The lower parts of a farm are generally in grass; the farmer should attend to his ditches, so that the water from all the higher parts of the farm may have an unobstructed course to a ditch a little above the bottom, from which it may be let at pleasure over the meadows, observing that it only runs over them, and does not stagnate.

BURNET.

It is a common error with the cultivators of burnet, to let cattle go into the fields at this time of the year; but it is bad management, and contrary to the intention of the culture. Keep it throughout autumn and winter from any cattle: it will then be ready in the spring, when most wanted, for sheep.

WALLING.

In the dry stony countries, walls are the common fence, and, when well made, are impenetrable, and extremely durable. This is the proper season to begin building them: they are made of whatever stone is most plentiful; either lime-stone, which is generally in quarries, rag-stone, or grit-stone. The best are lime and grit; because generally most plentiful, and at the same time much the easiest cut; but whin-stone cannot be used to profit for this or any other work, as it is so hard that it will not cut without great difficulty. But some grit-stones cut with so much ease, that you may build walls of it without mortar, as true as with, and will, if well laid, last nearly as long. In the enclosures of wastes, it is proper by all means to begin the walling in this month, which is so soon after the hiring time, Michaelmas, and continue the work all winter.

DIG MANURES.

All this month the carts should be employed in carrying marl, chalk, clay, or ditch-earth, upon soils that are light enough to admit carting on through winter.

CUT ANT-HILLS.

This is the proper season for destroying ant-hills. Many ploughs have been invented for cutting them off level with the surface of the field, ready to be carted away; and if that is the way you take with them, such machines are of great use; for they will certainly do the work of many men.

MADDER.

Look well to the land deep ploughed in the preceding month for madder, to observe if it lays perfectly dry: if the water hangs at all in the furrows, or the water-furrows, let them be immediately cleansed, so as to run off without the least obstruction; for it is very pernicious to any land to be soaking in stagnant water: instead of receiving benefit by autumnal tillage, it is much injured.

PEASE.

Upon dry soils, that plough well in winter, the end of this month is a good time to sow the hardy hog-pea, which will remain uninjured by frosts, and be much earlier in the following year than those sown in the spring.

SHEEP.

The lean stock sheep will yet be kept in the remains of the summer grass, and on the sheep-walks; but the fat stock must now be at turnips or cabbages. Remember that fatting cattle, of whatever sort, should have as much meat as they like; but should, at the same time, be prevented from making any waste. Giving fat sheep the turnips or cabbages is a dubious point; many farmers urging strenuously the necessity of saving carriage, by letting the sheep feed them off where they grow, provided the land be dry enough; but others are of a contrary opinion, and carry the turnips to a grass field, where they give them to the sheep as required, and without so much waste as is made in the other case. Upon these systems I shall remark, that, if the land is dry, you may feed off without waste; because the soil is so clean, that there is no soiling by dirt or poaching; and, by bringing a stock of lean sheep to eat up the leavings of the fat ones, there will not be the least loss: but this point, of lean stock following the fat ones, is too much neglected by many farmers, who only run over their fat sheep, and consequently spoil a proportion of their crops. It is good management, in many farmers, to have a sheep-rack filled with hay always in the turnip field that is fed by fatting sheep: others give them bran or barley meal, oil-cake, or pollard, or malt-dust, in troughs; the dryness of which is a corrective to the moisture of the turnips, and will contribute well to the more speedy fattening of them. I do not, however, mention these assistants as being absolutely necessary; because I know that thousands of sheep are fatted on turnips, without any such help. Another article of dry food, which agrees excellently with turnips, is cut chaff: this makes very good dry meat for sheep that are fatting on turnips or cabbages.

THE TEAMS.

This is an idle month for the teams in many farms; but should not be so with good husbandmen: for, as I have often remarked, they must be constantly well fed, and employed. There are many works that may be executed in this month, after ploughing is finished: on light dry soils, the marl, chalk, or clay carts, should not stop: they may work from the first day to the last. In wetter soils, you may cart any sorts of manure on to grass lands, provided you use small carts.

DRAINING.

In this month you may begin the work of hollow-draining, which, on wet lands, is the *sine qua non* of husbandry. It is in vain to think of farming them to any profit, without this improvement. Manuring before this is done, is but expending money for five per cent. advantage, where 50 ought to be the return. Lay your land dry before you attempt other improvements: the first step is cutting deep and large ditches around the wet fields; then you gain a requisite fall to take the water clean away from the drains.

If the soil is very wet, it will be necessary to cut the drains near each other; for instance, about a perch, a perch and a half, or two perches asunder; by which means it will be laid in most soils in dry and wholesome order. Fill them with whatever materials you can get the easiest; bush-faggots, stones, straw, &c. &c. No improvement in agriculture is greater than what is effected by these drains, nor any that will sooner repay the expences. In many parts it is well known, that the first arable crop will repay the whole expence, which is a profit not to be reaped in any other article to which a man can attend.

ELKINGTON'S DRAINING.

A very necessary attention is to be paid by every occupier of wet land, to the cause of the moisture which injures him: if, as common in many parts of Essex, Suffolk, and Norfolk, which are, in general, countries not marked by strong inequalities of surface, the wetness proceeds from the texture of the soil, especially the under-stratum, and not from springs, the system of hollow-draining applied to the whole surface, is the best cure the evil may admit; but in many districts, the case is different; one spring breaking out on the slope of a hill, will damage much land below, and appear in so many places irregularly, as to assume the appearance of many distinct springs, or a general wetness of surface. The common system of hollow work, in such cases, may fail entirely, though the expence may be greater than that of another system discovered, or practised, or published first by Mr. Elkington, under the patronage of the Board of Agriculture. It would be impossible, in the limits of a Calendar, fully to explain this system; but the principle of it is to discover what may be called the mother-spring, and to cut it off by one deep drain passing across, but above the spot where it breaks out. The boring at the bottom of this deep cut has, sometimes, considerable effect, not only on the spring immediately in contemplation, but on others also that become visible at a distance, and has, in some cases, operated effectually to a great distance, and even on the opposite side of a hill more than a mile from the spot. The principal use of mentioning this system here is, to caution a young farmer to consider well the circumstances of the wetness which injures him, in order that he may ascertain the cause, and the best method of applying a remedy. If he duly and attentively examines his farm, and its relative situation in respect of hills or mountains in his immediate vicinity, and marks all the places where springs break out, he can hardly fail of going to work with more skill and more appropriated efforts, than if such a system of drainage had not been in his mind.

WOODS.

Now begins the business of wood-cutting. In some parts of the kingdom this is a profitable part of husbandry; but, in many others, it pays very indifferent returns. If there is a long carriage on the wood, it rarely answers well enough to induce a spirited farmer to apply his attention and money to it: arable and grass land will pay better; and supposing one hundred or two hundred pounds, or more, of his stock, applied to hiring the wood, he may in general be assured, that the same sum, thrown into his farm in an increase of improvement by draining or manuring, will pay him better interest. But, if it is expedient to keep woods, it is much worth attention to apply them to the best use. Old experienced farmers are always attentive enough in this; but young ones, and gentlemen just beginning their husbandry, are apt to be too careless. Labourers will ever persuade them to what pays themselves best. Hop-poles, hoop-stuff, hurdles, short faggots, long ones, bushes, stakes, and edders: each of these articles is, in some places, more profitable than any of the rest; and I believe, on an average, those will be found most beneficial, for which the purchasers come and take them away. Carriage, on so cheap and bulky a commodity as wood, is a very great deduction from the product.

COVER TURNIPS AGAINST FROST.

We are indebted to the Rev. Mr. Munnings, near Dereham, in Norfolk, for a method of securing turnips against frost, which deserves attention. He drills at two feet equi-distant on the flat; and in a dry season, towards the middle or end of November, he covers them so by a deep ploughing, as to secure them to a great degree. I must, however, remark upon it, that it seems a husbandry better adapted to the Northumberland system of drilling, often mentioned in this Calendar, than to that of flat work. This mode of drilling is upon the crown of ridges. If the turnips at this season are drawn, and two rows set close together in one furrow, and then the ridges split; they will be more effectually secured from the frost than possible upon flat work.

STEAMING ROOTS.

This application of fire to the preparation of roots for feeding stock, is a practice of the present age, and it is thought a very favourable one, and largely practised by many very intelligent cultivators. The best apparatus which I have viewed is that of Mr. Stares, of Hampshire, of which there is an explanation and a plate in the *Annals of Agriculture*, vol. xxviii. p. 228. The great effects of feeding cows with steamed turnips mixed with cut chaff, has been detailed by the Rev. Henry Close, in the Communications to the Board of Agriculture; and this application of potatoes in feeding horses, has been practised upon a very large scale by H. C. Curwen, Esq. M. P.

FATTING BEASTS.

Of the food raised on the farm, the best for this business is parsnips; next carrots; then come cabbages, potatoes, and turnips. If a farmer has a due provision of these plants, with good hay for cutting into chaff with straw, he will not find corn and oil-cake profitable, unless beef promises to be very high, and corn and cake very cheap. Whatever the food, it cannot be too often repeated, that small quantities are to be given at a time; that troughs, cribs, &c. are to be kept very clean, and that litter must be so plentiful, that the beasts have clean hides and warm beds.

BREEDING HORSES.

Our young farmer, on entering his farm, will have to determine upon the system of keeping mares for breeding, or using geldings or mares without increase. As a general question, I should presume he would, if he be well advised, pursue the latter system. Breeding demands a larger number to be kept, and a management much more careful and attentive, and more obedient servants, than the more common conduct. The hazards, also, are not inconsiderable: I have attempted, in various districts, to analyze the benefit derived from breeding; but have not, in any, been so convinced of the profit, as to deem it proper to pay any regular attention to the article in this Calendar. Where it is the general practice of every farmer, the servants and labourers acquire a certain degree of skill and care, very useful in the business, and which may render it not disadvantageous with tolerable *luck*; but, in such cases, there is not much need of Calendars to remind: in other situations, I cannot advise a young farmer to breed; he will find it more safe and profitable to avoid it.

GARDEN.

A good and well-cultivated kitchen-garden is a capital object to assist in house-keeping. I have inserted in the *Annals of Agriculture*, vol. xxxix. pp. 228, 304, the scheme of a circular one for being kept under the plough, which may be safely recommended as a plan well calculated to save expence.

PLANT FRUIT-TREES.

This is the proper season for planting fruit-trees. A good orchard is a valuable article upon every farm, as they well understand in Kent. The mode of performing it, and the whole management, belongs to the Calendars for gardeners rather than for farmers.

FISH-PONDS.

This is a proper season for making fish-ponds. The object, in certain situations, may be advantageous to a farmer who occupies his own land: it is in all an agreeable, and a very comfortable assistance to house-keeping. The best means of doing it is by a head or bank across a gentle vale, with a puddled wall in it, and a sluice at the lowest part. If the declivity of the land be gentle, a head of six or eight feet depth, will in some cases float many acres with water. The expence, including every thing, may be reckoned at from 1s. to 1s. 6d. per cubical yard of the head. The late Mr. Bakewell thought, that water well managed would pay better than any grass: it must, of course, depend on the price and demand for fish.

Nothing can be done in this work without a spirit-level. The first station should be from side to side across the vale where the head is to be; and having fixed two stakes, one on each side on the slopes, a packthread may be strained from stake to stake, which gives the opportunity of measuring the intended bank: and if the number of cubical yards contained in it be not greater than the sum proposed to be expended, proceed to level from one stake around to the other, staking out as you proceed the line of the surface of the intended water, and measuring the contents of the area; the operator is able to compare the quantity to be floated, with the expence of the bank, sluice, &c.; and if the one be adequate to the other, he can proceed with the works.

SALT FOR SHEEP.

If the land of a farm be wet or moist, or otherwise unfavourable to sheep, the evil may be considerably remedied by the practice of giving salt in shallow troughs: they should have as much as they will eat, the quantity being very small, though they are exceedingly fond of it, little as they take.

DEPTH OF PLOUGHING IN BREAKING UP GRASS LAND.

This point demands some attention: it should be considered first, with relation to breaking up, by paring and burning; and, secondly, by mere ploughing.

It is a nearly general notion in every part of the kingdom, that the first ploughing after this operation should be shallow. We cannot admit that the idea, being far spread, is therefore just; for the same notion prevails every where with relation to dung and the sheep-fold; in which case there is great reason to believe it erroneous. Manures that putrefy, and consequently become volatile, cannot be *buried*, to use the farming term: plough as deep as you please, they will rise sooner or later into the atmosphere; but with fossil bodies, and, probably, with the ashes of paring and burning, the case may, in a good measure, be different: and the great success of the common management gives reason to justify the principles on which it proceeds. It may, therefore, be deemed a safe maxim not to plough after this operation, for the first time, more than three, or at most not more than four inches.

With relation to breaking up grass lands by ploughing for various crops, where it is not intended to burn, I have seen it performed many times on various sorts of land, and I have done it largely myself on gravelly loams, and on clayey and sandy loams, and I never remarked any striking difference either in the practice or the effect. But in countries where they usually plough deep, that is, six, seven, or eight inches, I have observed (and it has been my own practice), that they plough up old grass shallower, that is, not above four inches deep, or at most five. A crop is every where put in on this first ploughing, except only in the case of summer-fallowing, peat, and other moors. By not ploughing deep, the atmosphere has a more direct influence in assisting the putrefaction of the sod, covered as it is with a crop, perhaps a smothering one.

Two circumstances here merit notice, which are, the use of the skim-coulter plough, and sowing on a stale furrow.

Mr. Ducket's skim-coulter plough, I consider as one of the best implements ever invented; it is most effectual, and applicable to a great variety of purposes, but to none more than breaking up old grass land. Every one knows, that when this is done with a common plough, there is between every furrow a seam of grass and weeds that vegetate through the summer, and injure the crop; but this is entirely prevented by the skim-coulter, and is applicable to every sort of soil that does not contain on the surface impediments of roots or stones.

The other point, that of sowing on a stale furrow, is a very good practice, in cases of breaking old lay, when done on soils that are not ticklish for getting on: wet clays and loams, supposing them not well drained, are often obliged to be delayed, sowing too late in the spring if ploughed in autumn; in which case it is safer to plough and dibble at once; but on other soils dry enough, as dry loams, sands, and chalk, it is better to plough in autumn, and plant early in the spring: the frosts, and successive variations of weather, sweetens the freshly-turned up soil, and crumble the surface enough to give a little mould, and not too much to impede the dibbler.

DECEMBER.

THRASHING.

THE thrashers must be kept constantly at work throughout this month, that the cattle feeding on straw may have a regular supply. Many farmers, who keep large stocks of lean or dry cattle, are attentive to thrashing out their worst straw first, and the best last, proceeding upon the same gradation through the winter, that every change of straw may be for the better. This is a just conduct, and cannot fail of having good effects on the cattle, who, it is well known, often fall away in their looks on a change of straw that is the least for the worse. The wheat should, upon these principles, be thrashed first, as that makes the worst fodder; next the oats, then the barley, and lastly, the barley or oats that had much clover mown with them; for, in wet seasons, the clover rises so high, that the straw is almost as good as hay. There is but little trouble in attending at harvest, to lay the corn so as you may begin with what you please, and the advantages to the straw-fed cattle certainly are great.

The thrashers should always be chosen from the labourers with some care: they should be honest, or the farmer will suffer much, if he does not watch them narrowly, as they may have many opportunities of stealing corn.

A thrashing-machine is an object of such importance to every arable farmer, that no intelligent one will be without it.

FARM-YARD.

Attend, without ceasing, to the littering of the yards, stalls, stables, cow-houses, hog-sties, &c. With a little management, all the urine might be preserved: the drains that carry off the overflowings of the yard, should lead to a small well, with a pump fixed in it: this pump should have a light trough turning on a pivot, to receive the liquid, and a heap of turf or marl be kept within reach of the trough: it should convey the liquid over the whole, which, being carted on to the land, would prove an excellent manure.

PLOUGH UP LAYS.

It is by this time wet enough to begin to break up grass lands, a work that should not be done while the land is dry; for it will not then turn up in clean, well-cut furrows. Ploughing grass lands is a very good piece of husbandry, when they are worn out and over-run with moss and other rubbish, or hide-bound. To keep land under such unprofitable turf is bad management: it should, by all means, be broken up, and kept in a course of tillage for three or four years, and then laid down again; by which conduct four times the profit will arise, that could be gained from keeping it in lay: but paring and burning much superior.

SHEEP.

This month your forward ewes may be expected to lamb, when you should be attentive to keep them much better than they have been in common through the autumn: they should have plenty of turnips or cabbages as fast as they lamb; for cattle that have young require as good keeping as those that are fatting; and if you let them have a rack of hay always in the field, it will be much the better for them. Draw the turnips or cabbages, and give them on a dry grass field. One great advantage of cabbages over turnips is the ease of cutting them, in case of the hardest frosts, when turnips cannot be had.

In case of extreme bad weather, it will be adviseable to bring your sheep under shelter. Most farmers are sensible of this, and drive them on such occasions into their hay-stack yard, which is not a bad way; but much inferior to giving them their hay in racks, in a warm yard, with sheds around it for them to feed under. The use of such a yard is so great, that I wonder they are not more common. In driving snows, sleet and rain, the injury sheep take in the open fields is great. Another circumstance which ought to have weight, is the raising plenty of rich dung: by keeping your sheep in very bad weather all day, and constantly of nights, in a yard proportioned to their number, you fold them perhaps in the most advantageous method of all others: for if a layer of turf or marl be spread over the bottom of the yard in autumn, and under all the sheds, and the sheep are kept well littered with straw, fern, or stubble, so as to be always perfectly clean and dry, they will in the winter make a great quantity of excellent manure.

SWINE.

This is the season for making the right profit by hogs, which is their dung. See that all the sows with pigs are well littered, so as always to be perfectly clean, with bright, healthy-looking skins. Also your fat hogs should be constantly littered up to their bellies. If they are not kept perfectly clean, you may depend on losing money, by not making so much dung as might be.

" In the management of store swine, I met with only one idea that requires registering; namely, that of oats being, in the opinion of professional men, preferable to barley, as a food, not of young pigs only, but of breeding sows.

" Another opinion, however, may be mentioned; namely, that young pigs require warm meat to make them grow. Corn and cold water will make them sleek and healthy; but warm beverage is considered as requisite to a quick growth. This, however, is registered as matter of opinion.

" In the management of fatting swine, they keep two or three little store pigs in the fatting sty, for a purpose which theory would not readily suggest. While the fatting hogs are taking their repast, the little ones wait behind them, and as soon as their betters are served, lick out their troughs! Beside the advantage of having, by this expedient, no waste, or foul troughs, there is another: the large pigs rise alertly to their food, lest the small ones should forestall them; and fill themselves the fuller, knowing that they have it not again to go to.

"The disadvantage of this practice is, I understand, the large ones are apt to lord it too much over the little ones, especially in a confined sty. If, however, they had a separate apartment assigned them, with an entrance too small for the fatting swine to follow them, this disadvantage would be in a great measure remedied."—*Marshall.*

WARM FOOD FOR SWINE.

In Gascony, from St. Palais to Anspan, I saw many fine white, and black and white hogs; they are fed much on acorns, but are fattened throughout this country on maize ground to flour, and boiled with water to a paste, and given fresh, milk-warm, every day. Some on beans. They are turned a year old when put to fatten: rise to the weight of two or three quintals. These are the hogs that furnish Bayonne with the hams and bacon, which are so famous all over Europe. The hams sell at 20d. the pound.

I have reserved this minute from some others of little consequence, for the opportunity of remarking, that, in England, the old custom of feeding hogs with warm food is totally discontinued; but it well deserves experiment, whether it would not answer in fattening, and also in the nourishment of sows and pigs. Such experiments are difficult to make satisfactorily, but yet they ought to be made by some persons who are able. Warm food in winter, regularly given, I should suppose, must be more fattening than that which is cold, and, in bad weather, half frozen.

FENCES.

Keep the hedgers and ditchers close to work all this month, so that they may be ready for other business in the spring. The three first winters of the lease should get the fences into good order; afterwards divide them into twelve parts, and do one every year, which will bring the whole to regular cuttings.

DIG MANURES.

Upon light and very dry soils it will be proper to keep the marl, chalk, or clay carts at work: indeed they should never stop; for, when a man hires such soils for improvement, the sooner they receive the manure, the greater will be his profit: for in some countries, landlords, after the first lease, either raise the rents considerably, or turn the tenants out. It is therefore highly incumbent on them to regain their expence with profit, within the term of the first lease; and that can only be done by marling very quickly at first.

MANURE HOPS.

Hops are by many planters manured in this month, if the season be favourable.

PLOUGH FOR SPRING CROPS.

Should this business, by great hazard, not have been executed in October or November, it must be done the first week in this month. To avoid spring tillage on wet land is essential. The Flemings know this fact well. "Passing Armentiers, met with an exertion of industry that deserves attention. Many stubbles were ploughed into beds eight or ten feet wide, and the furrows digging out, and the earth spreading on the beds. These fields were intended for beans. They leave the land thus prepared till March (this was seen in autumn), and then plant without further tillage. As spring tillage is thus avoided on wet land, the system must be admitted to be excellent."—*Travels*, 1789.

THE LABORATORY.

To have permitted, fifty years ago, such an article as this to form a part of a Farmer's Calendar, would have been thought an absurdity; but such an opinion will not, I trust, prevail at present. The intimate connexion between agriculture and chemistry is unquestioned. Let it not, however, be imagined, that I propose a farmer should addict himself to a pursuit which is not only very captivating, but also very expensive; I would merely have him able to analyze, in a rough way, his soils, and the fossil manures which may be found under them; for this purpose the apparatus is not formidable: and for a laboratory, if he has a small blacksmith's shop and forge (which no large farm should be without), it will serve the purpose very well. It is only providing a cupboard, under lock and key, to secure his glasses and the other articles necessary for these experiments. One caution, however, I must premise, if he has no forge, and converts some other room to this purpose, if it be attached to his house or offices, and a fire (from whatever cause) should consume them, the laboratory would vitiate his insurance at a fire office, unless he enters it, and pays for the whole as *doubly hazardous*, in the language of insuring.

The apparatus necessary consists of the following particulars: A deal table with a drawer, which drawer should be sufficiently short of the full breadth to allow a range of holes in the upper surface for glass jars to stand, free from danger of falling.

Half a dozen glass cylindrical jars, nine or ten inches long, and three or four inches diameter; with a few of the same shape, but smaller. One or two others, five or six inches diameter and eighteen inches long: the contents in ounce measures marked on them with a diamond, beginning at top (when they stand inverted, or the mouths downwards) 1, 2, 3, &c. descending. These to receive and measure the air or gas expelled by heat.

Two or three old gun-barrels (the touch-hole closed), cut to the length of eighteen inches, and a small bent tube of iron, or of tin, finishing in an iron screw, for screwing to the end of the barre already mentioned.

If a forge is not at hand, a cast-iron furnace, nine or ten inches diameter, with a circular hole to receive the gun-barrel, and a moveable dome cover to receive the end of a tin pipe, six inches diameter, and 12 feet long, and moveable while up the chimney of the room. The fire to be of charcoal.

A trough or small tub of water, on legs, adapted in height to the elevation of the gun-barrel when in the furnace, with a perforated shelf in it, on which the jars to stand for receiving the air expelled.

A correct pair of scales and weights.

To try whether the gun-barrels or any retorts are really air-tight, an air-pump is very useful, as I have found that blowing in them when under water is not a criterion to be depended on.

An evaporating saucepan; that is, a tin saucepan with a circular fixed frame of tin, four inches high, to receive a glass jar containing the earth to be dried by the boiling heat of the water, as it is necessary in comparisons, for all specimens to be of the same degree of dryness.

Pint or quart phials with ground stoppers of sulphuric acid; muriatic acid; carbonate of potash; solution of potash; ammonia (caustic); muriate of ammonia (the common solution of sal ammoniac). And small phials of the substances mentioned in the Appendix, as tests for the examination of water.

A few glass funnels, ribbed, for filtrating with blotting-paper.—A hydrostatic balance.

The whole of this apparatus may cost from ten to twenty pounds.

The most material point in examining a soil, and it is a point in which the authors I have read have committed great errors, is that of taking the specimen. I have always crossed a field in several directions, and taken about a tea spoonful in abundance of places, suppose an hundred; and thus taking about a quart, reserved it for trials in glass phials with ground stoppers. The under stratum should be examined, to know if it be retentive, permeable, or calcareous.

All specimens may be kept a month before trying, which will enable the farmer to compare various soils with his own, under every similar circumstance.

In trials with the gun-barrel, he may put one ounce in it, and then fill up with pounded flint boiled in muriatic acid, which yields no air or gas.

The experiments should be double; in this dry, and also in the humid way: upon the latter the following passage from Dr. Fordyce's Elements of Agriculture, will explain his method of analysis.

" Take one thousand grains of the dry soil, apply to it half an ounce of muriatic acid, and four ounces of water in a glass, stone-ware, or porcelain vessel, sufficiently large; let them stand together till no more effervescence takes place; and if it was very considerable, pour in half an ounce more of the acid; let this stand also till the effervescence ceases; if any arose upon pouring it in, continue to add more acid in the same manner, until what was poured in last, produces little effervescence, which is often at the first, and generally at the second or third half ounce.

"After the effervescence has ceased, put the whole in a filter; let the solution filtrate through; pour half a pint of water upon what remains in the filter, let that filtrate also in the same vessel; add to the solution thus filtrated, an ounce and a half of caustic volatile alkali for every ounce of acid used; if any precipitation take place, there is magnesia, earth of alum, or the calx of a metal (generally iron or copper) contained in the soil; after adding the volatile alkali, the whole is to be thrown into a filter again; after the filtration has taken place, pour into the liquor a solution of mild, fixed, vegetable alkali, in water; if there be any calcareous earth in the soil, a precipitation will take place; continue to add the solution of the alkali till no fresh precipitation ensues; throw the whole into a filter; let the liquor filtrate off; pour on by degrees a pint of water; let that filtrate off also; dry what remains in the filter; it is the calcareous earth.

"To know the proportion of sand and clay.

"Take what remains in the filter after the first solution in the foregoing operation, and by elutriation separate the sand from the clay, dry and weigh them; if there be any pyrites it will appear in the sand.

" In the above processes, the principal things to be attended to, are,

" Whether there be any metallic, or aluminous salts, as these are absolute poisons, and therefore are to be decomposed by quick-lime.

" Whether there be such a proprotion of neutral or earthy salts as to be hurtful, in which case, the solution in *process* (second) will taste salt: a soil containing them in so large a proportion, will hardly ever admit of culture for grain.

" Whether there be calcareous earth, and in what proportion, as that ascertains the propriety of applying any manure containing it, and the quantity of that manure.

" What the proportion of sand and clay is, which ascertains the propriety of adding sand or clay.

" Whether there be pyrites, as that shews why and when a soil will be long of being brought into cultivation.

" Pyrites are best destroyed by fallowing, and afterwards applying lime."

When Mr. Professor Davy, of the Board of Agriculture, shall publish his excellent lectures, a more exact analysis will be explained.

If in this method of analyzing a soil the proportion of calcareous earth be large, the trial of the gun-barrel will give a quantity of gas proportioned to such quantity of calcareous earth, for which allowance must be made; but if that quantity be small, the ounce measures of air or gas gained from an ounce of soil, and its degree of inflammability, will be the easiest test of the fertility of the specimen tried.

To aid a young beginner, I shall venture to recommend his reading the papers on this subject in the 6th, 7th, 8th, and 12th volumes of the *Annals of Agriculture.*

Another method of examining soils deserving attention is, by weighing them hydrostatically, as their fertility will generally be in proportion to their specific levity, if the expression may be permitted. Fabroni was, I believe, the first who recommended this test. He gives the following trials :

Various soils, weighed hydrostatically, have given the following result, the barometer being at 27-7, and *his* thermometer at 13 :

1. The fertile soil of a wood,	1,530
2. A kindly soil,	1,582
3. Green marl,	1,591
4. Fertile earth of a friable staple,	2,100
5. Volcanic earth, which does well for vines,	2,111
6. Friable reddish earth,	2,131
7. Strong land for wheat, vetches, &c.	2,160
8. Earth of a mountain, where they cultivate olives, barley, &c.	2,200
9. Sandy sterile land,	2,120

The long evenings of December, will give a farmer time for acquiring these branches of chemical knowledge.

FARM ACCOMPTS.

In the month of October this subject was touched upon, but in the greater leisure at present, our farmer may be more likely to be able to give the requisite attention to a point which demands much consideration.

There is not a single step in the life of a farmer that does not prove the advantage of his keeping regular accompts; and yet there is not one in a thousand who does it. This is among the many instances in which the unenlightened situation of the practisers of the art, is the evident reason for the backwardness in which the art itself is found, by any man who searches for the principles deduced from practice, which ought to give it the regularity of a cultivated science.

A few rough memoranda, or figures, to yield a gross accompt of the general receipt or payment, are usually the greatest exertions that common farmers, who pretend to keep accompts, make in this line.

The advantages of clear accompts are obvious in every other pursuit in life; and to conduct those of a merchant by the Italian method of double entry, has been made an essential branch of education for the classes intended for commerce. Men engaged in large speculations, who are not regular in their accompts, are always supposed by the prudent part of the world to be in a dangerous situation; nor is there a greater a greater reproach to a merchant, short of actual bankruptcy.

But agriculture is destined to be, in all its detail, an exception to every thing else. Men engage in it without previous education, or even study and inquiry, and they conduct large concerns in it without those accompts known to be necessary in every other pursuit. With the lowest and most uneducated farmers this is pardonable; but what excuse have gentlemen for such conduct?

It should be remembered, that experimental agriculture, or even those ideas more or less detailed which we meet with in conversation, must depend for their justness very much on accuracy of accompts. For a supposition deduced from general observation on a farm, and grossly conceived, must fall exceedingly short for correctness, of the regular detail of exact accompts.

The general fact is, however, admitted; and accordingly it is common to hear gentlemen speak of their accompts. But, unfortunately, they are usually kept in such a manner as to prove rather the means of fortifying prejudices, than removing errors: all those questions of nicety, where the contrasts are not exceedingly strong, relative to the comparative profit of different soils, of different courses, of different applications of the same soil, of different modes of culture, &c. depend on accompts. Keep your accompts in the mode of one man, grass is more profitable than tillage; keep them in a different method, and the contrary shall be the result. The variety in the mode of keeping these accompts is very great, even among gentlemen of considerable attention, carefulness, and accuracy.

This comes from the great and undoubted difficulties which rise in many forms, whenever an attempt is made at positive accuracy. They are not imaginary but real difficulties, and such as will demand a considerable attention to obviate. I have reflected on the subject for many years, and they are few in which I have been satisfied with any approach towards accuracy. For while there are distinctions which must every where be kept up, there are many minutiæ that must be sacrificed, in order to render the accompt tolerably easy to keep, without an attention that a man in an active line of life cannot give. To keep to this medium is the great difficulty.

The nature of the farm must, in some instances, regulate the mode of the accompts. Suppose a man has the evil of an open field one, with scraps and bits of land scattered amongst his neighbours: in such a case, it is impossible for him to keep an accompt for every field; and yet this is one of the most indispensable points that in general must be adhered to; for he who does not know what every field has paid him, is deficient in the very foundation of experience. In this light all little fields on a large farm are nuisances: they derange accompts entirely, if the greatest attention be not paid, and they are as inconvenient in cultivation, and attended with as much loss in headlands and borders, as they are ruinous to any exactness of accompt.

But as many persons keep accompts without attending to this point, I would observe, than when all the wheat, all the barley, all the oats, &c. are respectively thrown together, some very essential objects of experience depend on guesses, which ought to be ascertained correctly. Has fallow, or clover, or beans, paid best, as preparations for wheat? How is that question to be answered, if all are huddled together in one barn or stack, and meet in the same accompt? *The farmer can guess nearly.* He may: but go to a chemist, ask him if his science was pushed to the present perfection by accepting such guesses, instead of experiment? besides, they are in their nature quite uncertain; and when a comparison is formed by two guesses, a very little error in each will amount to so much in both, as to overturn all authority. Another point is, a man's guess being influenced by a favourite theory: a rigid friend to fallows, when he draws, by guess, a comparison between them and beans, will be apt, in the nature of things, to be partial: he should not put himself in the situation: he who would abhor the idea of falsifying a fact that is before him, might guess, at least, without sufficient accuracy.

If the fields be not very small, the inconvenience of keeping crops separate is little. Stacking corn is better understood and executed in the Isle of Wight than in most other parts of the kingdom: a great is rarely seen there: a farmer who has 500 acres of corn has only small ones. With such, accompts are kept separate with great facility: at least, if there be difficulties in it, there are others we shall meet with abundantly greater.

To sow one field with several crops at the same time, part wheat, part clover, &c. is very bad and inconvenient management, and ought to be avoided, were accompts out of the question. If they cannot be shunned, these must necessarily be more complex.

The first object in keeping accompts is, to ascertain the expences, in order to divide them accordingly.

Rent, Tithe, and Parish Taxes.—These articles demand three accompts, to be kept separate; but they are all to be arranged on the same principle. The amount of the two last, when known, which is at the end of the year, must, like the rent, be divided over every field for which an accompt is kept: this is very easy, when the measure of the fields is known. I need not observe, that the farmer, in dividing the rent, should do it as exactly and as fairly as possible, and that the two other articles should be proportioned to the rent.

But here occurs one difficulty, which is, I confess, puzzling: it is the difference between the gross and the neat measure of the fields of an inclosed farm. The hedges, ditches, and borders, take up, in many farms, a considerable portion of the field; from one-eighth to one-twelfth, and in some, even more*; now if these be reckoned and accounted for as a part of the field, then the acreable produce is affected, and even the profit of the husbandry, by a circumstance not essentially connected with it; and if two fields be compared in their husbandry, that may be most advantageous which has least border, and for that reason, which would derange a comparison entirely. I know but one method of getting rid of this difficulty, which is, to measure the neat contents where the plough goes in an arable field, and where the scythes cut in a grass one, and then deducting the total of those measures from the gross contents of the farm, throw the difference into one accompt by itself, under the title of *fences and borders*, to which accompt must be charged the proportion of rent, tithe, and parish taxes. If wood be cut or grubbed from these borders, or grass mown from them, the value of the wood or hay to be credited. The expence of the fences to be charged, and the balance of the whole, for it may every where be expected to prove a losing accompt, considered as the expence of *fences*, and acreably divided over the whole farm, like rent, tithe, or parish taxes. The only person who ever had an attention to this accuracy, was Mr. Baker, the experimenter to the Dublin Society. He published a map of his farm, with the gross and neat contents of every field. For want of observing the precaution, many experiments have been made, and many conclusions drawn, which are mere errors.

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* Margins of grass are common round the fields in Suffolk.

Sundry expences may be the title of an accompt, which must have place on every farm. Whatever payments concern the farm in general, and not any field or object in particular, and is not included in the preceding articles, must be entered under this title. Instances are: a bailiff's salary; payments to rat or mole catcher; mending roads; expences at markets, &c.

Wear and tear includes all payments to blacksmith, carpenter, wheelwright, harness-maker, &c. But in the division of this article, there must be a variation from rhe preceding; they are divided over the whole farm, but these must be proportioned differently: the arable lands will absorb the greatest part of these expences: mowing grass very little; and feeding ground still less. But to avoid any arbitrary estimation when a rule can be established, the proper mode of dividing this expence per acre, will be by making the expence of the teams a rule for it: to find how much per cent. or in the pound, of the team accompt, this expence of wear and tear amounts to, and charge it accordingly.

The *team* accompt is that which is in general more mistaken than any other on a farm. Nothing is more common, than every day to see accompts in which ploughing is charged at 4s. an acre, or at 5s. or at 10s. or whatever may be the hiring price of the country: but few words are necessary to shew that this is entirely fallacious: it is probably much under the real expence. Every practical farmer must know, that the way to have cheap tillage is to keep the teams well employed: when a man's own work is done his team stands still if he do not employ it for his neighbours; to do which, he will work for them below the value, and yet find some advantage in it. In consequence of such a conduct being common, to say that such is the price of tillage can never be accurate. It has by no means that best accuracy of *price*; because you cannot buy your commodity when you want it; and he who depended on the market for all the work of his farm, would soon find the state of his fields calling for a very different system.

The means of ascertaining the real expence of all team-work is very obvious, but depends totally and absolutely on accurate accompts. So much per week in summer for their green food: so much hay and oats eaten; so much for shoeing and farrier; so much for the actual decline of value; and so much in labour for attendance, give the real expence of the team. In order to divide this total expence among the work executed, a day-book is necessary; which a man may keep himself, or trust to his bailiff, as he pleases: it must contain the work of the teams and men every day in the year, specifying the field or business they are employed in. At the end of the year the amount of expence is proportionally divided among the work, and the clearest truth and correctness are necessarily the result.

I ought to observe, that this accuracy is very desirable for ascertaining various circumstances. The comparative profit of grass and arable land depends much on it. Some persons, from too lightly estimating the expence of teams, think arable the most profitable; and others, whose calculation of those charges runs perhaps too high, give too much into the counter opinion. I can easily conceive, that many strenuous advocates for fallows might lose a little of their warmth, if they knew what the expence of ploughing an acre of land really was on their farms. Such instances might be multiplied: they are indeed obvious to every man capable of uniting the theory with the practice of a business.

The article of manure is much more complex, and, upon the whole, the most difficult accompt there is for a farmer to keep. It must be arranged under the title *Farm-yard*; and it connects with so many objects, that no little care is necessary to keep it; and with the greatest attention some doubts will still remain.

Suppose the system to be that of carting a stratum of marl over the yard before foddering begins: that expence is to be ascertained at once without any difficulty; but how is the straw to be charged?—Cattle may be put out to straw in this country at 1s. or 1s. 6d. per week. At these prices a ton will pay about 7s. or 8s.; but while the cattle may be thus supported, the farmer may buy straw, with a view to the dung, at 20s. or 30s. a ton. This contrast is difficult to settle. The price per week is arbitrary, though actual: men take them at those rates, because they have none, or not enough, of their own; and it is not ascertained what value cattle will really pay for the straw; which may be more, or may be less. The whole is uncertain.

But with the straw of one's own crop, there is a double difficulty; because there must be two valuations instead of one. We must reckon so much an acre, or load, for it, and so much a week for the cattle that eat it; but both suppositions. Among counter objections, we must choose the least. The best method, perhaps, is to charge the *farm-yard* accompt with the price of the straw, at which it could be sold, deducting the expence of carrying it out; and to credit the same accompt with the price per week of keeping the cattle; which price is charged to the debtor side of the *cattle* accompt, as a part of the expences of keeping them. Whatever labour is bestowed on the dung, in shovelling and cleaning yards, throwing up the urine, turning over, &c. is charged of course to it. When the whole is carted on the land, the total expence is divided by the number of cubic yards, and the price per yard ascertained. It is charged to the accompt of the fields on which it is spread; and though the whole advantage is by no means exhausted by one crop, yet the whole expence must be charged to the crop that receives it, or the accompts would be kept open so long as to create confusion.

The time of balancing the books every year, should be that of entering the farm: this is most usual at Michaelmas; but the crop of the year is not then disposed of: to avoid valuations, which ought never to be relied on, when certainty can possibly be gained, the old year's accompts are to be kept open long after the new year ones are begun; that is, till the corn is all thrashed and sold, till the fatting beasts are gone, and till all those circumstances are decided which relate to the preceding year. This is essential to exact accompts, and can by no means be dispensed with. In this case, valuations may be nearly rejected, but there are others in which no management can exclude them: these are; in *live stock* not bought and sold within the year; and *implements*.

A man may stock his farm with cows at 10l. each: but if he suppose them, some years after, to be worth the same sum, he will grossly deceive himself. He must value them every year, and also the young stock which he rears with a view to keep up the number, or for sale: and the rule by which he should make the valuation, ought to be the price they would sell for at the moment. The same management must direct him with succession beasts, bought or bred for fattening; and also with a flock of sheep. On which last head I must observe, that the want of keeping such accompts as I am describing, is alone the reason for a difference relating to the profit of sheep. Can any thing be a clearer proof of the barbarity of accompts as they are kept at present by flock-masters, than the surprizing question once in agitation among them, whether they gain or lose by their flocks? a question that then arose from Mr. Macro's paper on that subject, published in the *Annals of Agriculture*. Such uncertainty could not obtain, if farmers kept regular accompts. The description of the profits of a flock not being properly a calculation, but an accompt, it ought to be transcribed from a man's private books; unfortunately, they are kept in such a manner, that difficulties multiply at every step in the endeavour to understand them.

Implements must all be valued every year, and the balance, being the expence, carried to the wear and tear accompt, of which it makes a part.

One of the most complex and difficult accompts, if not the most so of all, is that of grass-lands, fed. It involves itself with cattle of all kinds, with hay, with the team, &c.; and in such a manner as to make an accurate separation very difficult. How is the value of the food to be calculated?—If 3s. a week for a cow or a bullock, or 6d. for a sheep be charged, it is merely arbitrary: such estimates are fallacious. They imply profits, but allow nothing for losses. On the other hand, if the actual profit or loss on the live stock be made the product; in that case, the grass-land must be made a mere cattle accompt: there are obvious objections to this;

but it is, upon the whole, less objectionable than a valuation per week, which must, in the nature of it, lead to error. On this principle, the accompt may be kept in the following manner:

One accompt opened for *mowing ground*, to which the rent, tithe, taxes, and all expences, in one total for every field mown, are carried; and the credit of it to consist of the value at the market price (carriage deducted) of the hay mown, as delivered to the team, fatting beasts, cows, sheep, &c. which several accompts are debited with their respective consumptions.

But the fields which are mown have also an aftergrass, which is fed; the accompt of the week's stock which are supported by it, ascertains the value in the manner presently to be mentioned.

The accompt of *feeding ground* comes next: all the total debits of the field must be carried to it. The credit side to consist of the food of the teams, charged at the price per week, suppose 3s. 6d., and of that of any cattle taken in to joist. These articles may be arranged; but those which result from profit on stock kept are not so easy.

There is farther, a *sheep* accompt; a *dairy* one; and another for *fatting beasts*. In these are to be charged all the expences peculiar to those articles: shepherd's wages; market expences, &c. to the sheep; fuel, straw-yard, &c. to the cows; and the purchase money of lean stock to the fatting beasts.

Further: the fatting beasts are put to turnips;

the cows have turnips, the sheep have turnips; how is this to be accounted for?—It creates a new difficulty; but we must examine the best mode of clearing it.

If the cattle accompt be charged with the prime cost of the turnips, that is, with the expence of cultivating them, it will by no means be fair, for the expence is usually greater than the value; and a man may, in a turnip country, buy them cheaper than he can cultivate them; he submits in some cases to a known loss, because he knows he shall be more than repaid in the barley that follows; but to transfer this loss to the cattle would be unfair. One way of proceeding is, to value the turnips at what they would sell for, and to debit the cattle accompts with their respective consumptions. But there are two prices of turnips; one, for carrying the crop on to another man's land; the other, for eating them in the field. The latter ought to be the rate chosen on this occasion, charging the cattle with the labour and expences of carriage. But the actual profit is a better guide.

Here, therefore, at the end of the year, five or six, or more, unsettled accompts are open, not one of which can be closed but by reference to each other. Hence arises the great complexity of the farmer's accompts; but, amidst this apparent confusion, order must be made to arise, or our labour is vain.

The reader will see that the main question on which this arrangement depends, is this—shall the profit or loss on live stock be assigned *to the stock* by a valuation per week; or, *to the land they feed on*, by a division per week of the actual profit or loss arising?

Suppose that two hundred pounds profit would be the balance of the sheep accompt if food be not charged; shall this sum stand as *profit*, and the fields fed charged necessarily with *loss*; or shall that balance be distributed proportionably among the fields which have supported the flock?—The balance of the accompt, 200l. amounts to 6d. per head per week for 52 weeks; they have been fed 15 weeks in *grass-lands fed*, 10 in *grass-lands mown*, 12 in *Great Staines* (a clover crop), 5 in *Ardera* (ruta baga), and 10 *Jermyn* (turnips). It is easy to divide the total among them; and if he wishes further accuracy, he may vary the price per week, according to the scarcity or real importance of the several sorts of food; but still keeping to the real total. This method of dividing the profit among the crops, is far preferable to assigning the 200l. as profit to sheep.

This remark applies equally to all the other live stock accompts.

The farmer sees clearly what he makes by the different kind of stock, by turning to their respective accompts; but none of them appear in the profit and loss accompt; there they are absorbed in the accompts of the distinct arable fields which produced food; and in the two others of grass-fed and grass-mown, or in the two last thrown together in one of *grass-land*.

That there is a complexity in this mode of arranging the accompts of live stock, is beyond doubt; but after the greatest attention that I have been able to give it, I see no mode of simplifying it. Submit to the rules here laid down, and you have the satisfaction of all the accuracy that is attainable; but in any other method it will remain unknown, whether the profit or the loss belong to the land, or to the stock that feeds upon it.

I am clear this method will be rejected by those who only read this paper in a common, transitory manner, without studiously examining all the points on which the arrangement depends; but, to such as will reflect on what they read, and give the due attention, I have little doubt but the method will appear satisfactory.

When so much profit is actually made, to divide it by a weekly accompt to the fields that fed the stock, is making an easy calculation, with full data before you: but to charge the stock with so much per week for feeding certain fields, when you do not know but the accompt of stock may be loss, not profit, is calculating without any better data than mere supposition.

Such are, I apprehend, the principal difficulties in keeping the accompts of a farm. I do not offer the mode as one that obviates all objections: I do not conceive it possible to obviate all; but I think that fewer sources of inaccuracy will be found in it than in any other.

WOODS.

The woodmen are at work through this month. In Worcestershire, &c. the sale of woods is very easy. "Those belonging to the Earl of Coventry are extensive, and are divided into fourteen equal parts, one fourteenth of which is annually felled; this fourteenth is again subdivided into small parcels or lots of 40 yards by 20; which subdivisions are made by cutting right lines through the wood, just wide enough to admit a person to pass, who examines and values each parcel according to its growth and quality, numbering the lots in a book prepared for the purpose, with the price affixed to each: this being done, a day is appointed for the sale, and persons, chiefly of the neighbouring villages, attend to purchase; amongst whom, the poor form no inconsiderable part, and for whose accommodation the wood is thus divided.

"There is one circumstance attending the sale, which, to a person unacquainted with the nature of the business, may appear extraordinary; that of disposing of the wood, and receiving the money, without the purchaser having any knowledge of the lot he pays for; this is done to prevent any dispute that might arise from several persons fixing upon the same lot. The purchaser describing to what uses he intends converting his wood, is placed by the person who disposes of the parcels, in that part which appears most suitable to his purposes, and the wood-ward having the name of each person prefixed

fixed to his lot, is prevented from making mistakes: this entirely answers the desired intent, and murmurings are seldom heard at succeeding sales: sometimes in the month of January the wood-ward begins cutting the underwood, taking care to leave a sufficient quantity of young thriving plants, either oak or ash, for the purpose of preserving a succession in the stock: the wood consists of two sorts of stores, which are called tellers; the oldest are called black barks, and are of 42 years' growth; these are felled in the barking season, for the purpose of procuring the bark, and are then carried off with the faggots by the purchaser of the lot; the next are called white barks, and are 28 years' growth, and remain standing for stores, with a proper quantity of 14 years' growth, till the wood is again felled.

"Some of the woods in Herefordshire are stored in the same way, and some are felled at 20 years' growth; some are cut at 15, when the wood is completely felled, and the poles used as hop-poles, which in that county is deemed a profitable mode; those of 20 years are regularly stored, and the poles converted into hoops, spokes, lath, hurdles, cord, wood for charcoal, and various other purposes.

Twining. *Wm. Phelps.*"

STRAW-FED CATTLE.

"I met with an idea that cattle may be satiated with straw; or, in other words, may be served with it in too great plenty. It has been observed, that after a dry summer, when straw is scarce, and the cattle have it dealt out to them regularly, they do better than when, after a plentiful year, it is thrown before them in profusion from the thrashing-floor; not through the superior quality of the straw in a scarce year, as these effects have been observed to be produced from the same straw. This subject is by no means uninteresting to those who winter large quantities of cattle: I have observed in Yorkshire, where cattle are kept tied up, and of course are regularly fed, that they in general do better at straw, than cattle in the south of England, where they go loose among a much greater plenty; but whether it proceed from the warmth, from their resting better, from the breed of cattle, or from their being regularly fed, and *eating with an appetite*, I will not pretend to decide."—*Marshall.*

LITTER· FARM-YARD, &c.

Littering all sorts of cattle, &c. is never to be omitted at this season. The quantity of manure made is an essential object: the following notes will shew certain proportions of dung to straw.

Mr. Moody.—Forty-five fat oxen, in fatting, littered with 20 waggon-loads of stubble, raised 200 loads, each three tons, of rotten dung, worth 7s. 6d. a load.

Every load of hay and litter given to beasts fatting on oil-cake, yield seven loads of dung, each one ton and a half, exclusive of the weight of the cake.

On a comparison between the oil-cake dung and common farm-yard dung, 12 loads an acre of the former much exceeded 24 of the latter.

Mr Arbuthnot.—One hundred and thirty-four sheep and thirty lambs, penned six weeks in a standing fold, and littered with five loads and 40 truss of straw, made 28 large loads of dung. Fed morning and evening in the fold with turnips. Ate two acres of turnips.

Value, dung,	£.10	0	0
Straw, at 20s.	5	15	0
Profit,	£.4	5	0
Per acre for turnips,	£.2	2	6
And per score per week,	£.0	1	9¼

William White.—Thirty-six cows and four horses tied up, ate 50 tons of hay, and had 20 acres of straw for litter: they made 200 loads of dung, in rotten order for the land.

The experiments of Mr. Moody and Mr. Arbuthnot, prove how well it answers to buy litter with a view to the dung: in feeding oxen with oil-cake, one load of straw makes seven of dung, each one ton and a half; and with feeding sheep with turnips, one trussed load made more than four and a half large loads, worth 7s. 6d. each. With Mr. White, 20 acres of straw, suppose 30 loads, made 200 of rotten dung in littering cows, which are six and a half for one: whence it appears, that litter may safely be purchased at a very high price, rather than be without it. An argument which should be convincing with those who have it in their wheat stubbles, and yet will not be at the trouble of chopping and carting home.

POULTRY.

Throughout this month poultry is on full sale. I made the following memoranda at Mr. Boys's, in Kent:

Mrs. Boys, who is as intelligent in her walk of management as her husband is in his, conducts her poultry with greater success than any person I have met with. ' While I was at Betshanger, a higler's cart carried off above 12 dozen of fowls for one draught: inquiring what could be the process that commanded such plenty, I found it so simple as to be explained in a moment—the labourers' wives and families who live on Mr. Boys's farm, do the whole; he supplies them with what offal corn is necessary, and they return Mrs. Boys the grown fowls, ready for market, at 3d. each, 6d. for turkies and geese, and 3d. for ducks; and her accompt, well kept, states a profit of 20l. a year, after all expences are paid, and the family well supplied: have also all the eggs without any payment. It answers as well to the people as it does to the farmer. A fat turkey, 21 lb. alive is 14 lb. dead. The climate and soil here both agree with poultry: for here is a farmer of the name of Kelly, who rears and sells 140 turkies per annum.

FATTING BEASTS

Demand constant attention, as already so often noted; the effect of acid food in fatting swine, has been long well understood, and it is remarkable that I found it applied in France to fatting bullocks.

To fatten a pair of good oxen at la Ville Aubrun, would take 45 cart-loads of *raves*, a sort of turnip, cut in pieces, and 20 quintals of hay: when the raves are done, they give the flour of rye or other corn, with water enough added to form a paste; this they leave four or five days to become sour, and then they dilute it with water, thicken it with cut chaff, and give it to the oxen thrice a day: when fed with raves the oxen do not want to drink.

At Bassie they finish with flour of rye, mixed as before mentioned: they assert that the oxen like it the better for being sour, and that it answers better in fatting them. They eat about a boisseau a day (weighing 22lb.) and never give this acid liquor without chopped hay.' It is proper here to remark, that in coming from Paris, we have met a great many droves of these oxen, to the amount, I guess, of from 12 to 1500, and that they were, with few exceptions, very fat; and considering the season, May, the most difficult of the year, they were fatter than oxen are commonly seen in England in the spring. I handled many scores of them, and found them an excellent breed, and very well fattened.

Limoges.—After the raves, give rye paste, as described above, but with the addition of a *leaven* *(levain)* to the paste, to quicken the fermentation, and make it quite sour: at first the oxen will not drink it, but they are starved to it; usually take it the second day, and after they have begun, like it much, and never leave a drop.

Usarch.—Fatten their oxen with raves, as above, and then with rye flour, made into a paste with leaven, and given sour, as before described.

Between Brive and Cressensac they fatten with maize, but, in order to render it tender, pour boiling water upon it, cover it up close, and give it to the cattle the same day; and, in this method, it is a most excellent fattener, both of oxen and poultry. But, in order to make them fatten sooner and better, they give them, every night, and sometimes of a morning, a ball of pork grease, as large as an apple: they say this is both physic and food, and makes them thrive the better.

The fact of hog's grease being given, was confirmed at Souilliac: it is given to increase the appetite, and answers so well, that the beasts perfectly devour their food after it, and their coats become smooth and shining. The most fattening food they know for a bullock is walnut oil-cake. All here give salt plentifully, both to cattle and sheep, being but 1d. per pound. But this practice is, more or less, universal through the whole kingdom.

In Flanders, from Valenciennes to Orchies, for fattening beasts and for cows, they dissolve linseed cake in hot water, and the animal drinks, not eats it, having various other food given at the same time, as hay, bran, &c.; for there is no point they adhere to more than always to give variety of foods to a fattening beast.

DAIRY.

"In large dairies, cheese-making is continued throughout the year. Not only cheese for the family, but factor's cheese also, is made through the winter season. In one dairy I saw a very considerable parcel of broad thick cheese, which was literally made in winter. Many tons of factor's cheese is every year made in this district, entirely from hay; which, if good, is said to afford not only closer, but richer cheese, than grass. Winter-made cheese, however, is long in ripening, and is liable to be scurfy, and white-coated; but time overcomes one of these disadvantages, and a coat of red paint the other."—*Marshall.*

"The cows of many dairies are said to come in too early in the spring: their milk is spent before the autumnal flush of grass sets in. The cool months of autumn are not only favourable to the manufacture of cheese, but the milk of that season is thought to yield a greater proportion of curd than that of the summer months. I mention this as the observation of a man who is singularly entitled to attention, being intimately acquainted with every department of the dairy management of this country. But may not this deficiency of autumnal produce, be in some measure owing to the nature of the long-horned cows; which, though they afford a flush of milk presently after calving, are observed (the higher bred ones at least) to lose it much sooner than those of most other breeds?"—*Marshall.*

Value of Fat Calves.

"Calves killed:

No. 1. 130 lb. alive; 72½ dead, paid by the butcher.
2. 101 ——— 57
3. 92 ——— 52
4. 103 ——— 57

When mutton is 5d. a pound in this country, the live price of a fat sheep is 2¾d. a pound: alive, it is half and half; but the halfpenny over is into the fifth quarter."—*Mr. Boys.*

EXPERIMENT FIELD.

The farmer who may probably wish to try some experiments on small spaces of land, before he enters more largely into any article of cultivation; those also who intend the culture of cabbages by transplantation; and others having any views that require a small tract of ground, will find it much deserving attention in a leisure time of the year, to mark out a small field for these various purposes: the nearer the house the better, provided the soil be not (for purposes of experiment) much better than the rest of the farm. From two to five acres may answer the purpose well. If it be rather too large, a part may be appropriated to lucern. Such a field should have the fences and gate absolutely and positively secure. The convenience and use of such a field are exceedingly great: if any new seed, whatever it may be, is put into a man's hand who has no such field, he must either sow it in the corner of some field, where, if it be a perennial plant, it will probably arrange very badly with successive cultivation, or into his garden, the richness of which may deceive him. Every division of the experiment field should be carefully registered, and especially whatever manure is carried to any part of it.

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APPENDIX.

USEFUL TABLES.

No. I.

Equality in the Weight of Cattle, between Scores, Stones, and Hundred-Weights. By the Right Honourable the Lord Somerville.

Scores.	Stones, at 14lb.		Stones, at 8lb.		Hundred, 112lb.		
	St.	lb.	St.	lb.	Cwt.	qrs.	lb.
20 equal	28	8	50	0	3	2	8
25 —	35	10	62	4	4	1	24
30 —	42	12	75	0	5	1	12
35 —	50	0	87	4	6	1	0
40 —	57	2	100	0	7	0	16
45 —	64	4	112	4	8	0	4
50 —	71	6	125	0	8	3	20
55 —	78	8	137	4	9	3	8
60 —	85	10	150	0	10	2	24
65 —	92	12	162	4	11	2	12
70 —	100	0	175	0	12	2	0
75 —	107	2	187	4	13	1	16
80 —	114	4	200	0	14	1	4

No. II.

SALTS. BY DR. FORDYCE.

Vitriolic acid unites with,

1. Fixed vegetable alkali, forming vitriolated tartar.
2. Fixed fossil alkali, forming Glauber's salts.
3. Calcareous earth, forming selenite.
4. Magnesia, forming magnesian Glauber's salts.
5. Clay or earth of alum, forming alum.

Nitrous acid unites with,

1. Fixed vegetable alkali, forming nitre.
2. Volatile alkali, forming nitrous ammoniac.
3. Calcareous earth.
4. Magnesia.

Muriatic acid unites with,

1. Fixed fossil alkali, forming sea-salt.
2. Volatile alkali, forming sal ammoniac.
3. Calcareous earth, forming fixed ammoniac.
4. Magnesia.
5. Earth of alum.

Fixed vegetable alkali,

Combined with air.	Salt of tartar. Ditto wormwood. Pot-ash. Pearl-ash. Fixed nitre.
Free from air	Caustic fixed volatile alkali. Common caustic. Soap leys.

—————unites with,

1. Vitriolic acid, forming vitriolic tartar.
2. Nitric acid, forming common nitre.
3. Muriatic acid, forming digested salt of Sylvius.

    When caustic, it dissolves,

    1. Oil, forming soap.
    2. Animal and vegetable substances.

Fixed fossil alkali,

Combined with air	Natron. Soda. Sal soda. Barilla. Kelp.
Free from air	Soap leys. Caustic fixed fossil alkali.

—————unites with,

1. Vitriolic acid, forming Glauber's salts.
2. Muriatic acid, forming common sea-salt.

    When caustic, it dissolves,

    1. Oils, forming Castile soap.
    2. Animal and vegetable substances.

Volatile alkali, unites with,

1. Nitric acid, forming nitrated ammoniac.
2. Muriatic acid, forming common sal ammoniac.
3. Phosphoric acid.

No. III.

No. III.

COMPARISON OF THERMOMETERS.

REAUM.		FAHRN.	REAUM.		FAHRN.	REAUM.		FAHRN.
0	—	32	15	—	66	30	—	99¾
1	—	34¼	16	—	68¼	31	—	102
2	—	36½	17	—	70½	32	—	104¼
3	—	38¾	18	—	72¾	33	—	106½
4	—	41	19	—	75	34	—	108¾
5	—	43¼	20	—	77¼	35	—	111
6	—	45½	21	—	79½	36	—	113¼
7	—	47¾	22	—	81¾	37	—	115½
8	—	50	23	—	84	38	—	117¾
9	—	52¼	24	—	86¼	39	—	120
10	—	54½	25	—	88½	40	—	122¼
11	—	56¾	26	—	90¾	41	—	124½
12	—	59¼	27	—	93	42	—	126¾
13	—	61½	28	—	95¼	43	—	129
14	—	63¾	29	—	97½	44	—	131¼

No. IV.

COMPARISON OF ACRES—FROM PAUCTON.

France arpent 100 perches 22 pieds, ..	1,0000
Paris 100 ditto, ...	0,6694
England acre, ...	0,7929
Ancona rubbio, ...	2,541
Bergame pertica, ...	0,12867
Bologna tornatura, ...	0,3947
Brescia piò, ...	0,6381
Calenberg acre, ...	0,5165
Crema pertica, ...	0,14812
Cremona pertica, ...	0,15608
Denmark tonde-hart-korn, ...	2,159
Spain fanega, ...	0,6720
Ferrara biolca, ...	1,2614
Florence stioro, ...	0,11461
Francfort-on-the-Maine acre, ...	0,3955
Gotha acre, ...	0,3967
Inspruck jauch, ...	0,8472
Livurnia stiora, ...	0,1094
Mantua biolca, ...	0,6059
Milan pertica, ...	0,1472

Modena biolca,	0,8169
Muscovy décétine,	2,907
Naples moggio,	0,6546
Padua campo,	1,0866
Parma biolca,	0,5967
Placentia pertica,	0,1494
Rhine arpent,	0,3336
—— morgen Rhinland,	1,668
Rome quartuccio,	0,11308
—— rubbio,	3,619
—— pezzo,	0,5170
Rovigo campo,	1,2597
Saxony morgen,	1,0842
Trente piò,	0,6810
Trevisa campo,	1,0201
Turin giornata,	0,7440
Venice passo quadrato,	0,000588
Verona vaneza,	0,02454
—— campo,	0,5889
Vicenzia campo,	0,7100
Zurich zuchart,	0,4883

No. V.

WEIGHT.

France libre poids de marc,	1,000
—— quintal,	100,0
—— tonneau,	2000
England pound Troy,	0,7618
—— pound avoirdupois,	0,9264
—— stone, 14lb.	12,970
—— hundred, 112lb.	103,76
Germany pound,	0,7320
—— marc of Cologne,	0,4777
Amsterdam pound of 2 marcs,	1,0046
—— stone,	10,046
Barcelona pound,	0,6278
Bremen pound,	1,0043
—— stone,	10,043

No. VI.

MEASURES OF LENGTH OF SEVERAL COUNTRIES.

	Inch.	*Decim.*
English foot,	12	
Paris foot,	12	816
Venetian foot,	13	944
Rhinland foot,	12	896
Strasburgh foot,	11	424
Norimbergh foot,	12	
Dantzic foot,	11	328
Danish foot,	12	504
Swedish foot,	11	733
Derahor cubit of Cairo,	21	888
Persian arish,	38	364
Greater Turkish pike,	26	4
Lesser ditto,	25	572
Braccio at Florence,	22	956
——— ditto, for woollen, at Sienna,	14	904
——— ditto, for linen, at ditto,	23	688
Vera at Almaria and Gibraltar,	33	12
Palmo di Archetti at Rome,	8	784
Canna di Arcetti,	87	84
Palmo di Braccio Mercantia,	8	346
Genoa palm,	9	78
Bolognian foot,	15	
Antwerp ell,	27	396
Amsterdam ditto,	27	216
Leyden ditto,	27	12
Paris draper's ditto,	47	148
Ditto mercer's ditto,	47	244
Roman foot,	11	604
Greek foot,	12	0875

No. VII.

No. VII.

SEVERAL USEFUL TABLES FOR PLANTERS.

A Table, to shew how many Plants, or Trees, may be planted on an Acre of Land, at different Distances.

In an acre are,

4 Roods, each rood 40 rods, poles, or perches.
160 Rods, 16 feet and an half each.
4840 Square yards, 9 feet each.
43560 Square feet, 144 inches.
174240 Squares of 6 inches each, 36 inches.
6272640 Inches, or squares of 1 inch each.

A Table, to shew how many Plants may be raised on a Rod of Land, at different Distances.

In a rod are 272¼ square feet, or 39,204 square inches; a rod will contain,

Trees or Plants.		*Number of Inches asunder.*	*Square Feet to each.*
2450	and 4 inches over	4 by 4	16
1960		5 — 4	20
1633	and 12 over	6 — 4	24
1089		6 — 6	36
816	— 36 over	8 — 6	48
612	— 36	8 — 8	64
490	— 4	10 — 8	80
392	— 4	10 — 10	100
272	— 36	12 — 12	144
261	— 54	15 — 10	150
	An acre will contain,		
108	and 360 feet over, at	20 feet asunder, or	400
160		16½	272¼
134	— 144 feet over	18	324
302	— 72	12	144
435	— 60	10	100
680	— 40	8	64
888	— 48	7	49
1089		8 by 5	40
1210		6	36

Trees

Trees or Plants.		*Number of Inches asunder.*	*Square Feet to each.*
1361	and 8	8 by 4	32
1452		6 — 5	30
1555	— 20	7 — 4	28
1815		6 — 4	24
2178		5 — 4	20
2722	— 8	4 — 4	16
2904		5 — 3	15
3630		4 — 3	12
4840		3 — 3	9
5445		4 — 2	8
7261		3 — 2	6
8712		2½— 2	5
10890		2 — 2	4
19305		1½— 1½	2¼
21780		2 — 1	2
43560		1	1

A Table for the more readily calculating the Value of several Crops on an Acre of Land.

19360	plants, at	0¼d. each	£. 20	23	4
9680		0½d.			
4840		1d.			
2420		2d.			
1210		4d.			
605		8d.			
7000	plants, at 2d. each,		62	6	8
5200	ditto,		43	6	8
2200	ditto,		18	6	8
9980	plants,	at 1d. each,	40	6	8
6970			31	0	10
6534			27	4	6
5400			22	15	0
5445			22	13	9
4356			18	3	0
3630			15	2	6
1000			4	3	4
160			0	13	4
15000	plants,	at 1½d. each,	31	5	0
7000			15	11	8
6534.			13	12	3
6660			13	17	8
5000			10	8	4

A Table of the Specific Gravity of several sorts of Wood.

	Specific Gravity.	*Weight of a Cube Foot.*	
		lb.	*oz.*
Thorn,	87	54	6
Crab-tree,	85	53	2
Quince-tree,	83	51	14
Mahogany,	82	51	4
Plum-tree,	80	50	0
Holly,	80	50	0
Ash,	76	47	8
Barberry,	76	47	8
Nut-tree,	76	47	8
English oak,	75	46	14
Beech,	74	46	4
Elder,	73	45	10
Pear-tree,	73	45	10
Mulberry,	71	44	6
Walnut,	69	43	2
Yew,	67	41	14
Maple,	66	41	4
Yellow deal,	63	39	6
Cherry,	61	38	2
Norway oak,	60	37	8
Sallow,	59	36	14
Sycamore,	59	36	14
Elm,	50	31	4

N. B. All the woods were very good of the sort, except the elm, and all very dry; the measure is English, and the weight avoirdupois.

No. VIII.

No. VIII.

A TABLE OF EXPENCE.

By the Day.			By the Week.				By the Month*.				By the Year.		
s.	d.		£.	s.	d.		£.	s.	d.		£.	s.	d.
0	1	—	0	0	7	—	0	2	4	—	1	10	5
0	2	—	0	1	2	—	0	4	8	—	3	0	10
0	3	—	0	1	9	—	0	7	0	—	4	11	3
0	4	—	0	2	4	—	0	9	4	—	6	1	8
0	5	—	0	2	11	—	0	11	8	—	7	12	1
0	6	—	0	3	6	—	0	14	0	—	9	2	6
0	7	—	0	4	1	—	0	16	4	—	10	12	11
0	8	—	0	4	8	—	0	18	8	—	12	3	4
0	9	—	0	5	3	—	1	1	0	—	13	13	9
0	10	—	0	5	10	—	1	3	4	—	15	4	2
0	11	—	0	6	5	—	1	5	8	—	16	14	7
1	0	—	0	7	0	—	1	8	0	—	18	5	0
2	0	—	0	14	0	—	2	16	0	—	36	10	0
3	0	—	1	1	0	—	4	4	0	—	54	15	0
4	0	—	1	8	0	—	5	12	0	—	73	0	0
5	0	—	1	15	0	—	7	0	0	—	91	5	0
6	0	—	2	2	0	—	8	8	0	—	109	10	0
7	0	—	2	9	0	—	9	16	0	—	127	15	0
8	0	—	2	16	0	—	11	4	0	—	146	0	0
9	0	—	3	3	0	—	21	12	0	—	164	5	0
10	0	—	3	10	0	—	14	0	0	—	182	10	0
11	0	—	3	17	0	—	15	8	0	—	200	15	0
12	0	—	4	4	0	—	16	16	0	—	219	0	0
13	0	—	4	11	0	—	18	4	0	—	237	5	0
14	0	—	4	18	0	—	19	12	0	—	255	10	0
15	0	—	5	5	0	—	21	0	0	—	273	15	0
16	0	—	5	12	0	—	22	8	0	—	292	0	0
17	0	—	5	19	0	—	23	16	0	—	310	5	0
18	0	—	6	6	0	—	25	4	0	—	328	10	0
19	0	—	6	13	0	—	26	12	0	—	346	15	0
20	0	—	7	0	0	—	28	0	0	—	365	0	0

* The month is 28 days.

A Table of Expence.

By the Year.			By the Month*.			By the Week.			By the Day.		
£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1	0	0	0	1	6½	0	0	4½	0	0	0¾
2	0	0	0	3	0¾	0	0	9¼	0	0	1¼
3	0	0	0	4	7¼	0	1	1¾	0	0	2
4	0	0	0	6	1¾	0	1	6½	0	0	2½
5	0	0	0	7	8	0	1	11	0	0	3¼
6	0	0	0	9	2½	0	2	3½	0	0	4
7	0	0	0	10	9	0	2	8¼	0	0	4½
8	0	0	0	12	3¼	0	3	0¾	0	0	5¼
9	0	0	0	13	9¾	0	3	5½	0	0	6
10	0	0	0	15	4	0	3	10	0	0	6½
11	0	0	0	16	10½	0	4	2¾	0	0	7¼
12	0	0	0	18	5	0	4	7¼	0	0	8
13	0	0	0	19	11¼	0	4	11¾	0	0	8½
14	0	0	1	1	5¾	0	5	4½	0	0	9¼
15	0	0	1	3	0¼	0	5	9	0	0	9¾
16	0	0	1	4	6½	0	6	1¾	0	0	10½
17	0	0	1	6	1	0	6	6¼	0	0	11¼
18	0	0	1	7	7½	0	6	0¾	0	0	11¾
19	0	0	1	9	1¾	0	7	3½	0	1	0½
20	0	0	1	10	8¼	0	7	8	0	1	1¼
30	0	0	2	6	0¼	0	11	6	0	1	7¾
40	0	0	3	1	4½	0	15	4	0	2	2¼
50	0	0	3	16	8½	0	19	2¼	0	2	9
60	0	0	4	12	0¾	1	3	0¼	0	3	3½
70	0	0	5	7	4¾	1	6	10¼	0	3	10
80	0	0	6	2	9	1	10	8¼	0	4	4½
90	0	0	6	18	1	1	14	6¼	0	4	11¼
100	0	0	7	13	5	1	18	4¼	0	5	5¾
200	0	0	15	6	10¼	3	16	8½	0	10	11½
300	0	0	23	0	3¼	5	15	0¾	0	16	5¼
400	0	0	30	13	8½	7	13	5	1	1	11
500	0	0	38	7	1½	9	11	9½	1	7	4¾
1000	0	0	76	14	3	10	3	6¾	2	14	9½

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* The month is 28 days.

No. IX.

No. IX.

TESTS FOR THE ANALYSIS OF WATER.

Litmus infusion—delicate for acids.
Acid of sugar—lime.
Tincture of turmeric and Brazil wood—alkalis.
Tincture of galls by spirit of wine—iron.
Prussiate of potash—excellent for iron.
Lime-water—carbonic acid in water.
Nitrated silver dissolved in dist. water—complete for muriatic acid.

No. X.

FOR THE STRONG GULLION.

Rhubarb, in powder, 1 oz.; long pepper, in ditto, half an ounce; peppermint-water, 12 oz.; compound spirit of juniper berries, 4 oz.; liquid laudanum, 1½ oz. Mix well and shake. The above one dose.

FOR A PINCH ON A HORSE'S WITHERS.

Mercurial ointment; then rye-meal poultice and brandy, if skin not broken.

DISORDER FROM HEAT IN A HOT CLIMATE.

One drachm camphor; dessert spoonful of brandy; half an ounce of sugar. Rub the camphor and brandy together, then add the sugar: when well mixed, add one pint of boiling water by degrees; cover up, keep till cold, and take a quarter or half a pint, or all, in a day, after James's powder. If a tendency to putrefaction, 2 dr. sweet sp. of vitriol to the pint.

James's powder—Pulvis antimonialis, according to the last Dispensatory.—Take, going to bed, 4 or 5 grains. If necessary, as far as 16 grains a day, at three or four times, may be taken.

POWDER FOR RHEUMATISM, WHEN FIRST COMING.

Pulvis ipecacuanha compositus, of the last London Dispensatory. In common cases, with no violent pain, 10 gr. at going to bed; in great pain, 20 gr.: wash down with diluting liquor.

FOR RHEUMATIC PAINS, OR THE LUMBAGO.

Dissolve as much salt in water as will make it swim an egg, rub it in with your hand on the part afflicted before a fire, for 15 or 20 minutes, just before going to bed. It is uncommonly effective.—*A. Y.*

No. XI.

BURDON's HORSE OINTMENT.

Into a a clean pipkin that holds about a quart, put the bigness of a pullet's egg of yellow resin; when it is melted over a middling fire, add the same quantity of bees-wax: when that is melted, put in half a pound of hog's lard; when it is dissolved, put in two ounces of honey; when that is dissolved, put in half a pound of common turpentine: keep it gently boiling, stirring it with a stick all the time: when the turpentine is dissolved, put in two ounces of verdegrease, finely powdered, but, before you put in the verdegrease, you must take off the pipkin (else it will rise into the fire in a moment); set it on again, and give it two or three wambles, and strain it through a coarse sieve into a clean vessel, for use, and throw away the dregs.

This is an extraordinary ointment for a wound or bruise in flesh or hoof, broken knees, galled backs, bites, cracked heels, mallenderse, or, when you geld a horse, to heal, and keep the flies away. Nothing takes fire out of a burn or scald in human flesh so soon: I have had personal experience of it. I had it out of De Grey; but finding it apt to heal a wound at the top before the bottom was sound, I improved it by adding an ounce of verdegrease.

FOR THE SCAB IN SHEEP.

Take one pound of quicksilver; half a pound of Venice turpentine; half a pint of oil of turpentine; four pounds of hog's-lard: Let them be rubbed in a mortar, till the quicksilver is thoroughly incorporated with the other ingredients. To be applied along the back on the skin, in two lines on each side; in one down the shoulder, and between the legs. The operation not to be later than Michaelmas.—*Sir Joseph Banks.*

THE

THE ROT.

A shepherd, who, when young, was shepherd's boy to an old man who lived at Netlam, near Lincoln, a place famous for the rot, told Mr. Neve, that he was persuaded sheep took the rot only of a morning before the dew was well off. At that time they folded, being open field: his master's shepherd kept his flock in fold always till the dew was gone; and, with no other attention, his sheep were kept sound, when all the neighbours lost their flocks.—*Cor. Lincoln Rep.* p. 330.

In Dauphiné, feeding in the dew is found to rot them more than any thing; on which account, they do not let them out of fold till the sun has exhaled it: salt is the preservative: 3 lb. to 40. *Young's Travels*, vol. i. p. 427.

FOR LICE AND TICKS.

Mr. Coke's receipt for dressing all his flock previous to winter: two pounds of tobacco; two pounds and a half of soft soap; one pound of white mercury in powder; boil in eight gallons of water one hour; part the wool once down each shoulder and the breast, and twice along each side; into which pour it: this quantity is enough for forty sheep.—*Annals*, vol. xix. p. 448.

FOR THE YELLOWS IN COWS.

The yellows, which affects the bag, and causes the loss of a teat: flour of mustard, two ounces mixed in any liquid, repeated two or three times in twenty-four hours, seldom fails.—*Somerset Report*, p. 110.

SLIPPING CALF.

Cows in calf, by smelling to any flesh, particularly in a putrescent state, occasions such a nausea as to stimulate the womb to action, and to eject the fœtus: well known in the North of Scotland, where it is particularly guarded against. Through the inattention of a game-keeper, there was always horse-flesh laying about my yards; and I had many slipped calf.—*Ross. Ann.* vol. xxxv. p. 46.

Bleeding when one-third or half gone, a preventive. When it does happen, bury the abortion immediately, and keep the cow as widely apart as possible from the herd, and not to receive the bull that goes with it. Certainly infectious.—*Essex Rep. Vancouver*, p. 127.

FOR THE GREASE IN HORSES.

Major Cartwright has found that the common groundsel, given plentifully to horses in the stable, will cure greasy heels.—*Cor. Lincoln Rep.* p. 377.

FOR THE STAGGERS IN HORSES.

Mr. Peacy, of Northbleach, lost several by this disorder: kept a goat; no staggers while he lived; but the goat dying, the staggers again attacked his stables. He keeps twenty horses. He procured another goat; and no more ill.

FOR THE MURRAIN IN HOGS.

Half a pound of flour of brimstone, ¼ lb. elecampane powder, 3 oz. of liquorice powder, ¼ lb. of anniseed powder: boil a handful of nettles in a gallon of small-beer, then add the powders to it. The above quantity given in milk, sufficient for six doses.—*Annals*, vol. xxxvi. p. 496.

THE MANGE.

This distemper in hogs, dogs, &c. is similar to the *pruritus*, or itch, in the human body, and is to be cured in nearly the same manner. It is a local disease, and arises from an insect, which works itself under the cuticle or outward skin. In the microscope this insect appears like the weavel bred in stale oatmeal, and is said to have a snout as well formed to work under the skin, as the hog has to root and turn up the outer surface of the earth. The idea of giving drugs to drive out the mange or itch, is ridiculous: cleanliness is the great preventive. The following ointment has never failed.

Take of hog's-lard 3 oz., sulphur vivum, in very fine powder, 1 oz.; white hellebore, fresh powdered, 2 drams; water of kalis, ½ an oz.; mix well together, by rubbing them on a marble slab. This quantity is sufficient for a hog of six or seven stone (14 lb.), and the whole should be very well rubbed in at one time. If, from length of time, chops or cracks are in the body, a little tar-ointment should be rubbed into them once in three or four days, till well. If, after curing, they should have a cough, with bellies too large, give each from half an ounce to an ounce, to two ounces of crude antimony, well levigated, in some of his food, and continue it for ten days or more. Tar-ointment is tar and mutton suet, of each an equal quantity, melted over a gentle fire, Good also for cracked heels in horses.—*Dr. Norford.*

METHOD OF PREPARING A CHEAP SUBSTITUTE FOR OIL PAINT. BY M. LUDICKE.

It often happens that people do not choose, or cannot employ oil-painting in the country, either because it does not dry soon enough, and has an insupportable smell, or because it is too dear. M. Ludicke employed, with the greatest success, the following method, for painting ceilings, gates, doors, and even furniture.

The Process.

Take fresh curds, and bruise the lumps on a grinding-stone, or in an earthen pan, or mortar, with a spatula. After this operation, put them in a pot, with an equal quantity of lime, well quenched, and become thick enough to be kneaded: stir this mixture well, without adding water, and you will soon obtain a white-coloured fluid, which may be applied with as much facility as varnish, and which dries very speedily. But it must be employed the same day, as it will become too thick the day following.

Ochre, Armenian bole, and all colours which hold with lime, may be mixed with it, according to the colour which you wish to give to the wood; but care must be taken that the addition of colour made to the first mixture of curds and lime may contain very little water, else the painting will be less durable.

When two coats of this paint have been laid on, it may be polished with a piece of woollen cloth, or other proper substance, and it will become as bright as varnish. It is certain, that no kind of painting can be so cheap: but it possesses, besides, other advantages: in the same day two coats may be laid on and polished, as it dries speedily, and has no smell. If it be required to give it more durability, in places exposed to moisture, do over the painting, after it has been polished, with the white of an egg: this process will render it as durable as the best oil-painting.

Weather Boarding.—To pay.

Three parts air-slacked lime, two of wood ashes, and one of fine sand or sea-coal ashes; sift through a fine sieve, add as much lintseed oil as will bring it to a consistence for working with a painter's brush; great care must be taken to mix it perfectly. It is impenetrable to water, and the sun hardens it.

To paint Boards, &c.

Melt twelve ounces of rosin in an iron pot; add three gallons of train oil, and three or four rolls of brimstone; when melted thin, add as much Spanish brown ochre, first ground fine, with as much of the oil as will give your colour; lay it on with a brush as hot and thin as possible; and some days after the first coat is dry lay on another. It will preserve plank for ages.

Cracks in Iron Vessels.

Six parts of yellow potter's clay, one of filings of iron, and lintseed oil sufficient to form the whole into a paste of the consistence of putty.—*Kastcleyn.*

No. XII.

THE NEW COVENANTS IN LETTING THE FARMS T. W. COKE, ESQ. M. P.

Supposing a farm to contain 540 acres arable land:

"Shall and will at all times keep and leave 90 acres, part of the arable land laid to grass, of one or more years laying; also 90 acres grass, of two or more years laying; each to be laid down with a crop of corn after turnips, and to continue laid two years at least; the time of laying to be computed from the harvest next after sowing the said seeds: and upon breaking up the same, after January 1, 1804, may be permitted to sow 45 acres (part thereof annually) with pease or tares for seed, to be twice well hoed; other part thereof with tares, for green food; buck-wheat, or any leguminous plant, or for ploughing in as manure, or summer-tilling any portion of the remainder.

"Shall not sow any of the lands with two successive crops of corn, grain, pulse, rape, or turnips, for seed (except the above-mentioned pea and tare stubble), without the leave or consent of the said his heirs, or assigns, being first had and obtained in writing.

"The land intended to be sown with pease, should not be till four years and a half after the commencement of the lease, upon the supposition that the *new tenant* may not be so situated as to have the turnips (covenanted to be left by old lease) completely clean.

"Lands for turnips, four clean earths at least.

"The turnips covenanted to be left in the last year, ninety acres to be mucked so far as the same will extend, and to be paid for by valuation, at the same time a due regard to be had to the cleanness of the land upon which they grow.

"Sheep, cattle, and all the other live stock, to be lodged upon some part of the premises when consuming the produce of the farm.

"Straw, chaff, and colder to be left without allowance.

"Incoming tenant to carry out the crop of corn, not exceeding the distance of ten miles, gratis.

"Rent payable forty days before Michaelmas (wherever a thrashing machine is, or shall be erected) if demanded, by notice in writing being left at the farm-house to that purpose."

The husbandry alluded to, but not clearly expressed, is,

1. Turnips,		90 acres.
2. Barley,		90
3. Seeds,		90
4. Ditto,		90
5.	Pease,	45
	Tares,	45
6. Wheat,		90
		540

Forbidding two crops of white corn running, not a bad covenant, simply; yet open to the following course:

1. Turnips,
2. Barley.
3. Clover,
4. Wheat,
5. Pease,
6. Wheat,
7. Clover,
8. Wheat,

Which would fill the land with weeds.

No. XIII.

A CATALOGUE OF FARMING IMPLEMENTS.

Asbey's thrashing mill, fixed,	£. 105	0	0
Do. moveable,	170	0	0
Lumbert's mole-plough, worked by women,	52	10	0
——— horse chaff-cutter,	42	0	0
A winnowing machine,	10	0	0
Cook's drill, and the corresponding tools,	40	0	0
A scuffler,	10	10	0
A stout plough with wheels,	10	10	0
A ditto smaller,	7	7	0
A Norfolk plough,	4	4	0
The best swing-plough,	4	4	0
Harrows,	10	0	0
Ditto,	5	0	0
Ditto,	3	0	0
A fallowing machine, the Norfolk heavy drill-roller,	20	0	0
Great iron roller for grass,	35	0	0
Smaller ditto,	25	0	0
Roller for arable land,	8	0	0
Barley roller,	4	0	0
Northumberland turnip-drill,	2	12	6
Garden drill and hoe,	4	0	0
Sir Joseph Banks's hay-stack apparatus,	20	0	0
Fen paring plough for burning,	4	4	0
Amos's bean-drill,	4	10	0
Kentish turn-wrest plough,	9	9	0
The mole drain-plough with wheel and roller,	6	0	0
One-horse carts with ladders, the only machine for carriage (except the following article), which should be on any farm; each	12	12	0
Small three-wheeled cart,	10l. to 12	0	0

Machine

Machine for weighing cattle alive,	20	0	0
Salmon's cage and steel-yard for weighing sheep and hogs,	8	0	0
——— wheel plough,	3	0	0
——— machine for weighing cattle, hay, &c.	100	0	0
——— chaff-cutter,	12	12	0
——— machine for ascertaining draught,	3	3	0
Sowing machine for broad-cast turnips,	0	10	0
Set of hollow-draining spades,	1	1	0
Ant-hill plough,	4	0	0
Machine for bruising beans and oats,	5	0	0
Double mould-board plough with expanding wings,	10	0	0
Smaller ditto,	5	0	0
Berkshire shim,	2	10	0
Ditto with three hoes,	3	10	0
Isle of Thanet shim,	10	0	0
Ducket's skim coulter,	1	1	0
——— hand-hoes,	0	10	0
——— miner,	3	3	0
The Hon. George Villiers' moveable sheep-house,	20	0	0
Apparatus for steaming roots,	20	0	0
Machine for breaking oil-cake,	4	0	0
Turnip-slicer,	2	10	0
Potatoe-cutter,	2	0	0
Potatoe harrow,	2	10	0
Jointed borer,	21	0	0
Hay-drag,	4	0	0
Horse dew-rake,	5	0	0
Wheel hay-rake,	1	1	0
Mr. Bentinck's machine for drawing up trees by the root,	100	0	0
M'Dougale's single drill for turnips and pulverized manures,	4	4	0
——— expanding horse-hoe, from 1 to 2 feet wide,	4	14	6
——— ditto from 8 to 18 inches wide,	3	10	0
——— expanding ditto, worked by men or boys,	2	2	0
——— Lord Somerville's patent two-furrow swing plough,	8	0	0

M'Dougale's

M'Doogale's Lord Somerville's patent single swing plough,	£. 4	14	6
—————— ditto, with chain draught,	5	0	0
—— Small's improved swing plough,	4	4	0
—— ditto with chain draught,	4	10	0
—— Duke of Bridgewater's draining plough,	7	7	0
—— mole-plough for draining,	3	16	6
—— ditto with a square iron and the miner fitted,	5	15	0
—— Hayward's extirpator, with 11 irons,	8	8	0
—— —— ditto with nine irons,	7	12	0
—— ditto with seven irons,	6	16	6
—— scarificator for grass-land,	6	6	0
—— cultivator with seven irons,	7	7	0
—— flexible tube to relieve cattle,	1	1	0
—— ditto for sheep,	0	10	6
—— skim-coulter,	1	2	0
—— turnip-slicer,	4	4	0
—— bruising machine for all kinds of corn, malt, and pulse,	8	8	0
—— straw-cutter, with three knives, to work by horse-mill,	16	15	0
—— ditto to work by hand,	11	11	0
—— ditto with two knives,	10	10	0
—— winnowing machine,	11	11	0
—— index gauge to ascertain the draught of horses in ploughs,	5	5	0
—— boring rods, for 20 feet deep,	5	5	0
Perkins'* improved thrashing-mill,	35	0	0
—— drill,	6	16	6
—— ditto, with drills for cake-dust, &c.	9	9	0
—— turnip-drill,	2	6	0
—— horse-hoe, ... 2 12 6 to	4	14	6
—— wheel-harrow,	3	13	6
—— hand-hoe,	0	4	6

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* Of Stockton-on-Tees.

No. XIV.

No. XIV.

SYNOPSIS OF THE BREEDS OF SHEEP. BY MR. CULLEY.

				Weight of Fleece.	Prices per lb. 1794.	Wethers, per qr.	Years old when killed.
1	Dishley,	No horns,	White face and legs,	Combing wool,	8 lb.	£.0 0 10	25 lb.	2
2	Lincoln,	Do.	Do.	Do.	11	0 0 10	25	3
3	Teeswater,	Do.	Do.	Do.	9	0 0 10	30	2
4	Dartmoor,	Do.	Do.	Do.	9	0 0 8	30	2½
5	Exmoor,	Horned,	Do.	Do.	6	0 0 8	16	2½
6	Dorset,	Do.	Do.	Carding wool,	3½	0 1 2	18	3½
7	Hereford,	No horns,	Do.	Fine do.	2	0 2 9	14	4½
8	South Down,	Do.	Grey faces and legs,	Do.	2½	0 2 0	18	2
9	Norfolk,	Horns,	Black faces and legs,	Do.	2	0 1 5	18	3½
10	Heath,	Do.	Do.	Coarse combing,	3½	0 0 6	15	4½
11	Herdwick,	No horns,	Speckled do.	Carding,	2	0 0 6	10	4½
12	Cheviot,	Do.	White faces and legs,	Do.	3	0 0 11	16	4½
13	Dunfaced,	Do.	Dun faces and legs,	Do.	1½	0 3 0	7	4½
14	Shetland,	Do.	Colours various,	Fine Cottony,	1½	0 3 0	8	4½
15	Romney Marsh,	No horns,	White faces and legs,	Combing,	8	0 0 10	25	2½
16	Spanish,	Horns,	Do.	Carding,	3½	0 4 0		

No. XV.

DIVISION OF SOILS.

Soil.	*Synonima.*	*Crops.*
I. Clay.	Strong land. Strong loam. Stiff land. Stiff loam. Limestone clay. *Marmy* clay.	Cabbages. Beans. Wheat. Clover. W. tares. Oats.
II. Sand.	Red. White. Black. Yellow. Heathy. Gravelly.	Turnips. Potatoes. Carrots. Barley. Buck-wheat. Trefoil. Ray, &c.
III. Loam.	Sandy. Gravelly. Hasel. Limestone. Stone-*brash*.	Potatoes. Turnips. Barley. Oats. Pease. Clover. Beans. Cabbages. Hemp and flax.
IV. Chalk.	Chalky loam. Downs.	Sainfoin. Barley. Pease. Turnips.
V. Peat.	Moss. Bog, red and black. Fen.	Potatoes. Rape. Cabbages. Grass.

No. XVI.

THE FARMER's LIBRARY.

Hitt on Barren Lands, 8vo.
Twamley on Dairying, 8vo.
Lisle's Husbandry, 2 vols. 8vo.
Fordyce's Elements of Agriculture, 8vo.
Billing on Carrots, 8vo.
Culley on Live Stock, 8vo.
Boswell on Irrigation, 8vo.
Wright on ditto, 8vo.
Blythe's Improver improved, 4to.
Baker's Experiments, 4 vols. 8vo.
Kirwan on Manures, 8vo.
Dossie's Memoirs of Agriculture, 3 vols. 8vo.
Transactions of the Society of Arts, 20 vols. 8vo.
Bath Society's Papers, 8vo.
Wight's Survey of Scotland, 6 vols. 8vo.
Darwin's Phytologia, 4to.
Gyllenborg's Elements of Agriculture, by Mills, 12mo.
Home's Principles of Agriculture and Vegetation, 8vo.
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Reprinted County Reports, by the Bd. of Agriculture, 8vo.
Communications to the Board of Agriculture, 6 vols. 4to.
Curtis on Grasses, 8vo.
Swayne's Gramina Pascua, folio.
On Potatoes. Published by the Board of Agriculture, 4to.
Johnston on Draining, 8vo.
Martyn's edition of Miller, folio.
Bailey's Advancement of Arts, 4to.
Anderson's Essays on Agriculture, 3 vols. 8vo.
Bannister's Synopsis, 8vo.
Hunter's Georgical Essays, 4 vols. 8vo.
Stickney on Grubs, 8vo.
Bartlet's Farriery, 12mo.

Dickson's Agriculture, 2 vols. 4to.
Naismith's Elements, 8vo.
Smith on Irrigation, 8vo.
Curwen's Hints on Live Stock, 8vo*.

No. XVII.

OLD AND NEW CHEMISTRY.

Old Names.	*New Names.*
Alkaline air,	Ammoniacal gas.
Alkali, caustic fixed.	Potash.
——— mild fixed.	Carbonate of potash.
——— fixed vegetable.	Ditto.
——— caustic marine.	Soda.
——— ditto mild.	Carbonate of soda.
——— phlogisticated.	Prussiate of potash.
——— caustic volatile.	Ammonia.
——— mild volatile.	Carbonate of ammonia.
Alum.	Sulphate of alumine.
Argil.	Alumine.
Barilla.	Carbonate of soda.
Blue, Prussian.	Prussiate of iron.
Butter of antimony.	Sublimated muriate of antimony.
Calces metallic.	Metallic oxides.
Chalk.	Carbonate of lime.
Charcoal.	Carbon.
Calcareous earth.	Lime.
Earth of alum.	Alumine.
Fixed air.	Carbonic acid gas.
Gas, hepatic.	Sulphurated hydrogen gas.
—— inflammable.	Hydrogen gas.
—— inflammable burning with a blue flame.	Carbonated hydrogen gas.
—— mephitic.	Carbonic acid gas.

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* Works of merit that may be here omitted, will be inserted should the Work be again reprinted.

Old Names.	*New Names.*
Gas, phlogisticated.	Nitrogen gas.
Gypsum.	Sulphate of lime.
Heat latent.	Caloric.
Magnesia, caustic.	Magnesia.
——— alba.	Carbonate of magnesia.
Natron.	Carbonate of soda.
Nitre.	Nitrate of potash.
—— cubic.	Nitrate of soda.
Oil of vitriol.	Sulphuric acid.
Principle acidifying.	Oxygen.
Pytrites.	Sulphure of iron.
Rust of iron.	Oxide of iron.
Sal ammoniac.	Muriate of ammonia.
Salt, common.	——— of soda.
—— of Sylvius.	——— of potash.
—— Glauber's.	Sulphate of soda.
—— Epsom.	——— of magnesia.
—— petre.	Nitrate of potash.
—— vegetable.	Tartarite of potash.
Selenite.	Sulphate of lime.
Spirit of salt.	Muriatic acid.
Tartar.	Tartarite of potash.
——— vitriolated.	Sulphate of potash.
Verdigris.	Green oxide of copper.
Vinegar.	Acetous acid.
Vitriol, blue.	Sulphate of copper.
——— green.	——— of iron.

No. XVIII.

A TABLE,

Shewing the difference between the customary Measure of Forty Quarts, and the Winchester Bushel of Thirty-two Quarts.

When the customary Measure is worth								The Winchester Bushel is worth										
Per Hobbet, or 80 Quarts.		Per Measure, or 40 Quarts.		Per Peck, or 20 Quarts.		Per Toll Dish, or 5 Quarts.		Per Quarter, or 250 Quarts.			Per Bushel, or 32 Quarts.		Per ½ Bushel, or 16 Quarts.		Per Peck, or ¼ bushel, or 8 Quarts.		Per Gallon, or 4 Quarts.	
s.	d.	s.	d.	s.	d.	s.	d.	£.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
20	0	10	0	5	0	1	3	3	4	0	8	0	4	0	2	0	1	0
19	0	9	6	4	9	1	2¼	3	0	10	7	7¼	3	9½	1	10¾	0	11¼
18	0	9	0	4	6	1	1½	2	17	8	7	2½	3	7¼	1	9½	0	10¾
17	0	8	6	4	3	1	0¾	2	14	3	6	9½	3	4¾	1	8¼	0	10
16	0	8	0	4	0	1	0	2	11	3	6	4¾	3	2¼	1	7	0	9½
15	0	7	6	3	9	0	11¼	2	8	0	6	0	3	0	1	6	0	9
14	0	7	0	3	6	0	10½	2	4	10	5	7¼	2	9½	1	4¾	0	8¼
13	0	6	6	3	3	0	9¾	2	1	8	5	2½	2	7¼	1	3½	0	7¾
12	0	6	0	3	0	0	9	1	18	5	4	9½	2	4¾	1	2¼	0	7
11	0	5	6	2	9	0	8¼	1	15	3	4	4¾	2	2¼	1	1	0	6½
10	0	5	0	2	6	0	0½	1	12	0	4	0	2	0	1	0	0	6
9	0	4	6	2	3	0	0¾	1	8	10	3	7¼	1	9½	0	10¾	0	5¼
8	0	4	0	2	0	0	6	1	5	8	3	2½	1	7¼	0	9½	0	4¾
7	0	3	6	1	9	0	5¼	1	2	5	2	9½	1	4¾	0	8¼	0	4
6	0	3	0	1	6	0	4½	0	19	2	2	4¾	1	2¼	0	7	0	3½
5	0	2	6	1	3	0	3¾	0	16	0	2	0	1	0	0	6	0	3
4	0	2	0	1	0	0	3	0	12	10	1	7¼	0	9½	0	4¾	0	2¼
3	0	1	6	0	9	0	2¼	0	9	8	1	2½	0	7¼	0	3½	0	1¾

No. XIX.

No. XIX.

TABLE OF COMPARATIVE PRICES OF WOOL.

By the Pound of 16 ounces.			By the Stone of 12 lb.			By the Tod of 28 lb.			By the Tod of 32 lb.			By the Pack of 240 lb.		
£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
At 0	0	0 per lb.												
0	0	9*	0	9	0	1	1	0	1	4	0	9	0	0
0	0	10	0	10	0	1	3	4	1	6	8	10	0	0
0	0	11	0	11	0	1	5	8	1	9	4	11	0	0
0	1	0	0	12	0	1	8	0	1	12	0	12	0	0
0	1	1	0	13	0	1	10	4	1	14	8	13	0	0
0	1	2	0	14	0	1	12	8	1	17	4	14	0	0
0	1	3	0	15	0	1	15	0	2	0	0	15	0	0
0	1	4	0	16	0	1	17	4	2	2	8	16	0	0
0	1	5	0	17	3	1	19	8	2	5	4	17	0	0
0	1	6	0	18	0	2	2	0	2	8	0	18	0	0
0	1	7	0	19	0	2	4	4	2	10	8	19	0	0
0	1	8	1	0	0	2	6	8	2	13	4	20	0	0
0	1	9	1	1	0	2	9	0	2	16	0	21	0	0
0	1	10	1	2	0	2	11	4	2	18	8	22	0	0
0	1	11	1	3	0	2	13	8	3	1	4	23	0	0
0	2	0	1	4	0	2	16	0	3	4	0	24	0	0
0	2	1	1	5	0	2	18	4	3	6	8	25	0	0
0	2	2	1	6	0	3	0	8	3	9	4	26	0	0
0	2	3	1	7	0	3	3	0	3	12	0	27	0	0
0	2	4	1	8	0	3	5	4	3	14	8	28	0	0
0	2	5	1	9	0	3	7	8	3	17	4	29	0	0
0	2	6	1	10	0	3	10	0	4	0	8	30	0	0

* Rules for calculating the value of each quantity, when the price per pound is not any number of even pence.

1. If the increase be one farthing, add to the sum found in the table, opposite to the given number of pence, 3d. for the stone; 7d. for the tod of 28 lb.; 8d. for the tod of 32 lb.; and 5s. for the pack. Thus, if the price be 9¼d. per lb., the value of the stone will be 9s. 3d.; of the tod of 28 lb. it will be 1l. 1s. 7d.; of the tod of 32 lb. it will be 1l. 4s. 8d.; and of the pack, it will be 9l. 5s.

2. If the increase be one halfpenny, add to the sum found in the table, opposite to the given number of pence, 6d. for the stone; 1s. 2d. for the tod of 28 lb.; 1s. 4d. for the tod of 32 lb.; and 10s. for the pack. Thus, if the price be 3½d. per lb., the value of the stone will be 15s. 6d.; of the tod of 28 lb. will be 1l. 10s. 2d.; of the tod of 32 lb. will be 2l. 1s. 4d.; and of the pack, it will be 15l. 10s.

3. If the increase be three farthings, add to the sum found in the table, opposite to the given number of pence, 9d. for the stone; 1s. 9d. for the tod of 28 lb.; 2s. for the tod of 32 lb.; and 15s. 8d. for the pack. Thus, if the price be 2s. 0¾d. per lb., the value of the stone will be 1l. 4s. 9d.; of the tod of 28 lb. it will be 2l. 17s. 9d.; of the tod of 32 lb. it will be 3l. 16s.; and of the pack, it will be 24l. 15s.

No. XX.

A USEFUL RECIPE FOR MAKING FAMILY WINE.

Take black currants, red currants, white currants, ripe cherries (black hearts are best), rasberries, each an equal quantity, or nearly so: if the black currants be the most abundant, so much the better. To 4 lb. of the mixed fruit, well bruised, put one gallon of clear soft water. Steep three days and nights in open vessels, frequently stirring up the mass; then strain through a hair sieve. The remaining pulp press to dryness. Put both liquors together, and to each gallon of the whole put 3 lb. of good, rich, moist sugar of a bright yellowish appearance. Let the whole stand again three days and nights, frequently stirring up as before, after skimming the top; then turn it into casks, and let it remain, full and purging at the bung-hole, about two weeks. Lastly, to every nine gallons put one quart of good brandy, and bung down. If it does not soon drop fine, a steeping of isinglass may be introduced, and stirred into the liquor, in the proportion of about half an ounce to nine gallons.

N. B. Gooseberries, especially the largest, rich-flavoured, may be used in the mixture to great advantage: but it has been found the best way to prepare them separately, by more powerful bruising or pounding, so as to form the proper consistence in pulp, and by putting six quarts of fruit to one gallon of water, pouring on the water twice, the smaller quantity at night, and the larger the next morning.

This process, finished as aforesaid, will make excellent wine, unmixed; but this fluid, added to the former mixture, will sometimes improve the compound.—*Bath Society's Papers*, vol. xi. p. 224.

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